NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES VOLUME 3, NUMBER 25 AUGUST 25, 1986

▶ MICRO-TO-MAINFRAME

DCA puts local net teeth into Irma links

BY PAUL KORZENIOWSKI
Senior Editor

ALPHARETTA, Ga. — Digital Communications Associates, Inc. last week announced products aimed at helping its army of microcomputer-to-mainframe link users migrate from stand-alone host connections to local-area network gateways into larger systems.

DCA introduced a series of products that enable IBM Personal Computers on IBM Token Ring Networks and other Network Basic I/O System (Netbios) -based networks to serve as gateways to IBM mainframes.

The company, which boasts roughly a quarter-million users of its Irma terminal-emulation and file-transfer products, also threw its considerable weight behind IBM's LU 6.2, stating its in-

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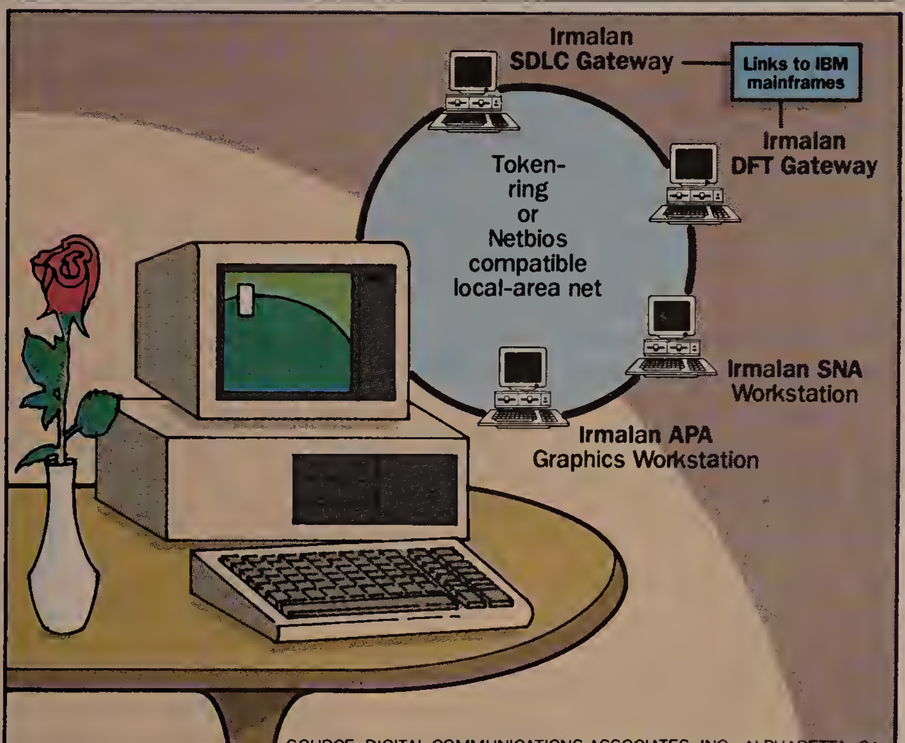
DCA extends Irma capabilities



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▶ PURCHASING PERILS

Tax bill a threat to user wallets

BY BOB WALLACE
Senior Writer

WASHINGTON, D.C. — The repeal of the investment tax credit in the tax overhaul approved last week by a key congressional committee would boost the price of long-distance communications services while weakening users' purchasing power.

Repercussions from the elimination of the investment credit would be felt throughout the communications industry. Analysts portend the loss of the credit could curtail long-haul carriers' plans to improve and expand their nationwide communications networks and could keep users from purchasing big-ticket communications equipment.

The investment tax credit allowed companies to subtract up to 10% of the cost of capital expenditures from their annual tax levy. Loss of the tax credit would, in effect, add 10% to the cost of such expenditures.

Glenn Rossman, a partner in the tax group at Arthur Andersen & Co.'s San Jose, Calif., office, said elimination of the investment tax credit will force users to rethink their five-year business plans. "Users will have to pay more in federal taxes. It may not change a company's prof-

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NETWORK LINE

News

The Bayou State bends a fiber carrier at will in an innovative networking arrangement that will reportedly save Louisiana $9 million in the next five years. Page 2.

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The upcoming merger of AT&T's Communications and Information Systems divisions may send more postdivestiture tremors rolling through AT&T's work force. Page 2.

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Patriotic fervor is not the reason all eyes are on the Air Force, which has developed a local-area network acquisition program based on standard local net components. Page 4.

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The federal government, having pulled Nasa out of the commercial satellite business, sends out Secretary of Transportation Elizabeth Dole to put a sheen on what appears to be a lackluster launch situation. Page 5.

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Ztel, the private branch exchange vendor that represents an original investment of $75 million, has reportedly trimmed its staff drastically and may soon be put on the block. Page 9.

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The University of Colorado successfully braves numerous disasters, both natural and man-made, in cutting over its new telecommunications system, which miraculously took place on time. Page 26.

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FEATURE FOCUS

Stay tuned: Corporate broadcasts receive high rating

BY JOHN DIX
Senior Editor

DULUTH, Ga. — It is tempting to describe the one-way videoconferencing network of A. L. Williams, an insurance agency here, as the business equivalent of evangelical television.

The firm uses its net to deliver "the corporate word" — motivational speeches and information — to its 145,000 predominantly part-time employees.

With approximately 530 nodes, the network is probably the largest corporate video network in the world. According to Barbara T. King, A. L. Williams' executive vice-president of communications, the

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▶ PROTOCOL POWWOW

TCP/IP future at stake

Vendor/user confab to propose Netbios link.

BY MARY PETROSKY
West Coast Correspondent

MONTEREY, Calif. — Expecting to raise more questions than they answer, more than 100 hardware and software vendors and a number of major user organizations will convene here today to decide the future of the Transmission Control Protocol/Internet Protocol (TCP/IP).

Following the three-day conference, during which attendees will hammer out implementation issues and future extensions to the communications protocols, several dozen organizations are expected to meet to decide on a draft proposal for an IBM Network Basic I/O System (Netbios)-TCP/IP link.

The conference, "The TCP/IP Vendors Workshop," is sponsored by the government's Internet Activities Board in con-

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▶ STATE NETWORKS

Louisiana hits LDX Net for major user jackpot

BY MICHAEL FAHEY
Staff Writer

BATON ROUGE, La. — The state of Louisiana has signed a five-year contract with a Chesterfield, Mo.-based fiber carrier that will chop more than $9 million from its voice and data communications bill.

In addition to providing a statewide communications network at a much lower price than was proposed by AT&T, the state's pact with LDX Net, Inc. allows Louisiana to terminate the agreement after only 30 day's notice. The carrier, meanwhile, is required to provide the security and transmission quality of fiber-optic service without raising its rates for five years. LDX Net is setting up the entire network for no installation fee.

The Louisiana network includes 331 voice circuits and 140 data circuits with about 1,000 drops. It serves nearly every state facility including governmental agencies, hospitals and colleges. "Unlike most states, we were hurt, not helped, by the recent drop in oil prices," said Randy Walker, a technical services director with the Louisiana Office of Telecommunication Management, which oversees the state's communications.

In addition to dealing with a massive decline in oil revenue, Walker and his colleagues at the state's central communications agency were faced with a whopping AT&T intra-Local access and transport area tariff hike of 750%, granted by the Louisiana Public Service Commission in July 1985. Moreover, Louisiana's Telpac bulk discount agreement with AT&T came to an end just six months later, in January 1986.

Walker's agency put out a request for proposal seeking bids for the state network in December 1985. Vendors were asked to submit two proposals. One called for the carrier to provide end-to-end network services, including network management. The other, termed backbone service, called for the carrier to provide in-state, long-distance service and made the state responsible for arranging local service with South Central Bell and independent telephone companies.

In addition to seeking a reduction in its overall intrastate long-distance bill, the state of Louisiana had other communications needs, Walker said. Because the state agencies' yearly budgets are fixed by law, Walker and his colleagues were looking for a stable billing arrangement that would not involve unexpected hikes. Furthermore, since declining revenue is likely to result in employee layoffs and declining network traffic, the state

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Demand for desktop processing power may soon push personal computer modem speeds to 18K bit/sec and beyond. **Page 29.**

▶ INDUSTRY OUTLOOK

AT&T reshuffle may spawn major layoffs

Official's remarks hint at reductions.

BY MARGIE SEMILOF
Senior Writer

BASKING RIDGE, N.J. — The specter of massive layoffs resulting from the upcoming merger of AT&T's Communications and Information Systems divisions was raised again last week, despite efforts by the company to exorcise it.

The layoff issue came to the forefront when Sam Willcoxon, an AT&T executive vice-president who will become president of the newly created Business Markets group on Sept. 1, was quoted by a reporter for *The Wall Street Journal* last week as saying the merger of the AT&T divisions would result in layoffs for employees in duplicate job positions.

According to the piece, Willcoxon did not specifiy how many employees would be let go.

Last week, however, company officials were quick to deny there would be widespread layoffs. AT&T spokesman Mike Granieri said it is too early to tell how many jobs may be affected by the consolidation, scheduled for Jan. 1.

In May, AT&T announced it was forming four business groups, including the Business Markets group, to replace the Information Systems and Communications divisions. The General Markets group will be responsible for small business and consumer products. The Services Markets group will handle the development of industry-specific applications and special relationships such as the AT&T and Olivetti Corp. joint venture. The Network Systems group will administer AT&T's communications network.

Granieri confirmed that duplicate departments within Information Systems and Communications will be eliminated by January. He said job overlaps could occur in such areas as billing, sales compensation and personnel. AT&T last year laid off some 24,000 Information Systems employees, after eliminating 11,000 jobs in the same organization the previous year.

Any employees displaced by the merger, Granieri said, would be offered a number of options, including possible placement within divisions that may emerge in the Business Markets group, transfer to other groups within AT&T or early retirement.

AT&T announced last week it had offered retirement incentives to 4,200 of its 19,000 service technicians if they retire by Oct. 1.

"We may need more employees in customer contact jobs," Granieri said. Such jobs could include sales positions in international communications services and data communications equipment and services.

"There are many things we can do to place these people in other jobs. But we are not going to know the sum total of the job duplication figures until the beginning of the year," Granieri added. "We won't be faced with displacing people until after we have run through all these other options."

The AT&T spokesman confirmed that the elimination of duplicate jobs would result in the savings of "millions of dollars a year." AT&T Communications and Information Systems currently employ a total of 210,000 workers. The Business Markets group is expected to employ 24,000 people before job cuts.

Analysts have speculated since divestiture that AT&T would face a series of layoffs — typical behavior for a company undergoing an upheaval like that experienced by AT&T.

According to Fritz Ringling, vice-president of strategies and telecommunications services at the Stamford, Conn.-based Gartner Group, "When you merge two organizations, there is obviously superfluous staff. AT&T's rental base is also eroding, so there will probably be a continued reduction of service employees, probably through attrition or early retirement options."

Referring to James Olson's takeover as AT&T chairman this month, Ringling said, "A new [chief executive officer] will usually try to leave his own imprint as early as possible. He may try to streamline operations in at least part of the company. That would account for even more reductions."

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▶ LINKING LOCAL NETS

Air Force uses Ulana to smooth net workings

Project seeks standard net components.

BY MARY PETROSKY
West Coast Correspondent

HANSCOM AIR FORCE BASE, Bedford, Mass. — In an effort to resolve communications problems between local-area networks, the U.S. Air Force has developed an acquisition program based on standard local net components that has drawn the attention of other armed forces agencies, as well as equipment vendors and systems integrators.

The two major goals of the Air Force's Unified Local-Area Network Architecture (Ulana) project are to foster interoperability among networks currently in use on Air Force bases and to reduce local-area networking costs by using off-the-shelf products, according to Tom Powis, Ulana program manager in the Air Force Electronic Systems Division.

The division is responsible for developing and acquiring communications gear for the Air Force.

In its first phase, Ulana I, the comprehensive program calls for use of standard 802.3 networking protocols in conjunction with Department of Defense Transmission Control Protocol/Internet Protocol (TCP/IP).

Ulana I defines a family of components that can handle both classified and unclassified data communications and provide terminal-to-host, host-to-host and terminal-to-terminal communications. In addition, Ulana I calls for gateways to the Defense Department Network, a network of government and defense agency networks that includes the Advanced Research Projects Agency Network, and facilities for network manangement and bridges to connect subnetworks.

"The Air Force has just about every kind of computer equipment installed," Powis said. As a result, he added, networks housed at different bases are unable to communicate with each other. "The whole thrust behind Ulana is to use commercial, off-the-shelf components. The program is intended to cover any Air Force base that has a need for a network. We're intending to go worldwide."

The Air Force has a considerable amount of interoffice data communications, most of which is currently handled with modems and dial-up telephone lines. "We use modems for everything — long-, medium- and even short-distance," Powis said. The range of host computers and various network architectures, however, makes it difficult to use gateways.

There are presently hundreds of local-area networks of various sizes, many of which are 802.3 networks, installed on Air Force bases. Although Powis is not certain of the number of bases worldwide, he said there are more than 100 bases in the contintental U.S. alone. He said most of the bases are potential Ulana customers.

> *"In its first phase, Ulana calls for use of standard 802.3."*

"To date we have done a lot of networking with dual-cable broadband," Powis said. "With Ulana I, we'll start to migrate to a mix of broadband and baseband. Cost is a big reason we're moving toward baseband." Baseband is less expensive than broadband and is easier to install, Powis said.

"With broadband, you're getting the potential for functionality, but I don't think a lot of Air Force bases will use it."

Ulana I also specifies fiber-optic distribution systems and attachment units for connecting Ulana components to a fiber-optic network.

In lieu of modems and dial-up lines, the Air Force hopes to use the large Defense Data Network to carry its long-haul communications.

Ulana has been in the works for just over a year. The specifications for the request for proposal (RFP) were started last February, and the RFP itself should be ready for release by the end of this year, Powis said. The Air Force has worked closely with Mitre Corp. of Bedford, Mass., to define Ulana.

The Electronic Systems Division is currently receiving comments on

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▶ ELECTRONIC MESSAGING

DEC MCI Mail link bows

All-In-1 capabilities expanded.

BY JOHN DIX
Senior Editor

MERRIMACK, N.H. — Digital Equipment Corp. last week expanded the electronic mail capabilities available under its All-In-1 integrated office software by providing a link to MCI Communications Corp.'s worldwide public electronic mail network.

VAX Mailgate for MCI Mail, a software product, enables All-In-1 customers to use the electronic mail network to deliver messages to remote All-In-1 users, other MCI Mail subscribers and domestic and international telex users.

All-In-1 customers can also generate hard-copy messages to be delivered by courier or the U.S. Postal System.

The software add-on to All-In-1 and DEC's software-based message router runs under the VAX VMS and MicroVMS operating systems on DEC processors ranging from the MicroVAX II to the VAX 7800.

The software incorporates MCI's proprietary link protocol and enables All-In-1 users to be registered as MCI Mail customers, according to Dick Derosier, marketing manager for electronic mail at DEC.

Links to MCI Mail are established and controlled by All-In-1 through 1,200 bit/sec dial-up lines. All-In-1 users can send mail, but must log on to MCI Mail to retrieve messages. Derosier said DEC would not permit MCI Mail to dial into All-In-1 because of security reasons.

Messages destined for users supported on remote All-In-1 systems are addressed using MCI Mail names, which will invoke the Mailgate function. Users unfamiliar with MCI Mail addressing conventions can seek help by typing "MCI" into the "to" field of All-In-1's mail menu.

"Typing in 'MCI' brings up additional menus to prompt the user for the appropriate addressing information, which is dependent on the MCI Mail delivery option desired," Derosier explained.

Directories of users are maintained by MCI and each All-In-1 site. Within All-In-1, these directories are supported by DEC's message router and can be updated using a management utility. Customers with multiple All-In-1 installations would keep directories of local users as well as register these users with MCI to provide for networkwide routing.

Derosier said All-In-1 previously supported MCI Mail and other E-mail services through a communications option that enabled the customer to log on to services and then upload messages.

VAX Mailgate simplifies the process by enabling the customer to generate a single All-In-1-type E-mail message that can be transmitted within the customer's own system, to remote All-In-1 users, to users of E-mail systems registered with MCI, to other MCI Mail subscribers or to roughly 1.6 million worldwide telex users.

Conversely, this wide population of users can use MCI Mail to send messages to All-In-1 users.

VAX Mailgate will be available in September from both MCI and DEC. The product will cost $7,500 for VAX 7800 size systems and less for smaller systems, Derosier said.

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"ABC membership applied for"

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▶ CORPORATE COMEBACK

Corvus first to put Intel 80386 chip in networks

Two new file servers and a workstation give users more speed, better disk access.

BY JOHN DIX
Senior Editor

SAN JOSE, Calif. — Corvus Systems, Inc. last week announced the industry's first local-area network products to incorporate Intel Corp.'s top-of-the-line microprocessor, the 32-bit 80386 chip (see "Corvus tests net server," *Network World*, June 2).

Corvus, struggling to resurrect corporate stability after suffering repeated quarterly financial losses, is depending on the new Series 386 products to put the company back on its feet.

The three products in the Series 386 line include a high-performance workstation and two file servers. Each benefits from the new Intel chip, which is bigger, more powerful and faster than the Intel 80286, the chip used in the IBM Personal Computer AT and found at the heart of other devices used as network file servers.

The chip, which operates at 16 MHz in the initial product implementation, has a memory management processor that enables the processor to support larger virtual memory than previous chips, according to Brian MacLeod, director of product programs at Corvus.

When combined with the chip's ability to process 3.5 million instructions per second, it enables Series 386 products to support more users more efficiently. "Disk access has typically been the bottleneck in network file serving systems," MacLeod said. "The operating speeds of the Corvus Omninet, IBM Token-Ring Network and Ethernet are not the performance restrictions of today's networks," he claimed. "Getting access to the disk drive and moving data to the system is the bottleneck."

Series 386 products, which are all IBM Personal Computer AT-compatible, include:

- A $12,795 low-end workstation with 512K bytes of random-access memory expandable to 2.5M bytes, up to 70M bytes of fixed disk capacity and a 1.2M-byte floppy disk drive.
- A $16,595 70M-byte file server with disk and main memory support similar to that of the $12,795 model, a 60M-byte, cartridge streaming tape drive and the Novell Netware 2.0A file server operating system.
- A $19,795 top-of-the-line file server that is configured like the mid-range 70M byte model, but supports up to 126M bytes of hard disk storage.

Each of the products has eight I/O slots, supporting a compliment of 8-, 16- and 32-bit I/O memory fetches, MacLeod said. This means the Series 386 can support add-on board products designed to work with 8-bit Personal Computers, 16-bit Personal Computer ATs and 32-bit add-in memory boards.

In terms of processing performance, the Series 386 products more than double that of the company's former Omniserver line. MacLeod said Corvus conducted benchmarks using a System Information Norton Utility, a test devised by Peter Norton, a well known microcomputer authority. The Series 386 rated at 13.3, meaning it was capable of processing the test load at 13.3 times the rate of a standard IBM Personal Computer XT. Corvus's older Omniserver achieved a rating of only 5.7.

In a related announcement, Corvus said it has begun development of an IBM Personal Computer AT-compatible, read-only memory basic I/O system (Bios) with Award Software, Inc. of Los Gatos, Calif.

The new Bios will take full advantage of the Intel 80386 processor and will offer advanced features and capabilities, the company reported. The refinements are said to include I/O support to protected and virtual 8086 modes, the latter providing access to greater memory, which enables support of larger programs and network operating systems. The new Bios will also enable the company to implement the defined but not-yet implemented multitasking and resource management functions of the 80286 Bios.

▶ SATELLITE INDUSTRY

Reagan camp bullish on private launch business

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — The Reagan administration last week appeared to be trying to put the best possible face on its decision to get out of the commercial satellite launch business by describing the opportunities the move will create in the private sector.

Secretary of Transportation Elizabeth Dole told reporters that American aerospace companies entering the market could satisfy the growing need for launch capacity and command a 50% share of the market worldwide.

The Department of Transportation's Office of Commercial Space Transportation, which has been tagged to serve as a watchdog agency for commercial satellite industry, will oversee regulation of the commercial launch industry. The department's responsibilities will also include the licensing of launch vehicles and quality control.

Thus far, in light of the administrations's plans to discontinue the National Aeronautics and Space Administration's role as a commercial launcher, three aerospace contractors have revealed plans to enter the satellite launch business.

General Dynamics Corp. said it would soon announce commercial contracts for its Atlas Centaur rocket, with launches expected to begin in 1989.

Transpace Carriers, Inc. of Lanham, Md. also announced plans to respond to the pent up demand for satellite launch capability. Transpace is licensed to market McDonnell Douglas Corp.'s Delta rockets.

Martin Marietta Corp. has also announced its intention to enter the incipient market.

Martin Marietta's large Titan rockets could be used to launch two satellites at a time.

The Titan 34D had been used to launch heavy military satellites, but was suspended after an April crash.

A U.S. Air Force investigation concluded that the crash was not due to Titan design flaws.

Secretary Dole said these U.S. firms will be in a good position to gain a market lead as a result of the satellite backlog that has been building steadily since the suspension of the shuttle program after the January space shuttle disaster.

Dole said Martin Marietta has received 21 launch inquiries, General Dynamics, 14 and Transpace, two.

The French company Arianespace currently has a 50% share of the worldwide satellite launch market.

However, Arianespace doesn't have the capabilities to handle any additional launches and will be focusing future research and development efforts on the creation of a shuttle vehicle, according to Dole.

About 75% of the satellites in orbit now could need repair or replacement by 1989, further adding to the backlog problem, Dole said. She added that between 10 and 15 satellites could be put in orbit in

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tention to support the protocol.

The company's Irmalan line, a series of software and hardware offerings, enables users of networks, such as the IBM Token-Ring Network, to be tied to an IBM host and to perform 3270 series terminal emulation and file transfers.

Support for the Token-Ring Network is rapidly becoming a prerequisite for vendors attempting to sell into IBM accounts, because the network is expected to glue many incompatible IBM products together, according to Howard Frank, a consultant based in Washington, D.C.

Customers using Irma cards on IBM Personal Computers attached to a Token-Ring Network had uncovered a number of compatibility problems.

This release overcomes those problems and should help to keep the 250,000 Irma customers in DCA's camp.

DCA also leaped into the burgeoning gateway arena for the first time.

Most local net suppliers are developing some type of gateway from their products to IBM hosts. DCA's new line includes four connectivity packages: Irmalan SNA Workstation, Irmalan APA Graphics Workstation, Irmalan SDLC Gateway and Irmalan DFT Gateway.

Two components are needed to link an IBM Personal Computer on a Token-Ring Network to an IBM host. One is terminal emulation software that resides on an individual workstation. Users can choose between two new products, Irmalan SNA Workstation and APA Graphics Workstation.

Irmalan SNA Workstation, priced at $495, enables a Personal Computer on a Token-Ring Network to support up to five IBM host sessions. A workstation can emulate an IBM 3278 or IBM 3279 series terminal or an IBM 3287 printer.

Irmalan APA Graphics Workstation enables a Personal Computer to emulate an IBM 3179G, 3270 PC/G, 3270 PC/GX graphics terminal, as well as a IBM 3278 or IBM 3279 series terminal. The product supports Computer Graphics Interface and Virtual Device Interface standards. The software also supports Graphical Data Display Manager, IBM's principal mainframe graphics package. Irmalan APA Graphics Workstation sells for $995.

The second component needed to link a personal computer on a Token-Ring Network to an IBM host is software that supplies a gateway between a Netbios network and an IBM host. DCA announced two types of gateways.

Irmalan Synchronous Data Link Control Gateway enables a Personal Computer to emulate an IBM 3274 or IBM 3276 cluster controller. The product supports up to 32 concurrent mainframe sessions and includes an RS-232 connection that works with a synchronous modem transmitting at speeds up to 9.6K bit/sec. Irmalan SDLC Gateway sells for $1,195.

The second option, Irmalan DFT Gateway, enables terminals to share a coaxial connnection to an IBM 3274 control unit operating Distributed Function Terminal mode. The DFT Gateway, also priced at $1,195, can supply up to five concurrent sessions. Personal computers can be attached to the controller at distances of up to 5,000 feet.

DCA signed an OEM agreement with Communications Solutions, Inc., based in San Jose, Calif., for the company's LU 6.2 offering, an IBM protocol for peer-to-peer communications.

Washington update

BY KARYL SCOTT
Washington, D.C. Correspondent

■ Charles Gardner, chairman of the U.S. Manufacturing Automation Protocol/Technical Office Protocol Users Group Steering Committee, last week urged members to petition legislators to approve the National Bureau of Standards' (NBS) Institute for Computer Sciences and Technology's latest budget request.

The institute has proposed a $10.2 million budget for fiscal year 1987. The U.S. House of Representatives has only approved an $8.3 million budget for the institute, which is developing methods for testing conformance to the MAP and TOP standards.

Ray Kammer, NBS deputy director, said the user-initiated effort may be for naught. "The government is looking to pare $20 billion from its 1987 budget. I'm not sure they will be interested in upping the $8.3 million."

■ The U.S. District Court of Appeals of Washington, D.C. recently ruled that the regional Bell operating companies no longer need the approval of U.S. District Court Judge Harold Greene to offer exchange services outside their geograhic service areas. The court found there was no basis for the Modified Final Judgement (MFJ) provision restricting regional telephone companies from offering exchange service outside their primary areas of business.

The ruling frees several companies, such as US West, Inc., and Pacific Telesis Group to provide cellular and paging services outside their regions. Prior to the ruling, the companies had to file waiver requests with Greene to offer outside exchange services. Most observers played down the impact of the appeals court ruling, labeling it little more than a formality.

A three-judge panel rejected US West's contention that the RBOCs should not be subject to the MFJ, since they were not part of the antitrust proceedings undertaken against AT&T.

■ The Senate will soon consider a bill calling for the establishment of an Information Age Commission to assess the impact of communications and computer technology on society, personal privacy, business, government, defense and education.

Sponsored by Sen. Sam Nunn (D-Ga.) and Sen. Frank Lautenberg (D-N.J.), S. 786 was approved recently by the Senate Government Affairs Committee.

■ Sen. Pete Wilson's (R-Calif.) name has been added to the list of co-sponsors for Sen. Robert Dole's (R-Kan.) legislation (S. 2565), which would transfer control of the MFJ from the Department of Justice and U.S. District Court Judge Harold Green to the Federal Communications Commission. Wilson would like to add amendments to the senate bill to protect ratepayers and limit the FCC's power to allow the BOCs into new businesses.

■ The House is considering two ratepayer protection bills. Amendments proposed by Rep. Al Swift (D-Wash.) and Rep. Thomas Tauke (R-Iowa), have been added to H. 3800, which would lift many of the MFJ restrictions on the BOCs. The measure would allow the BOCs to enter manufacturing and information services.

The amendments would require the BOCs to furnish comparably efficient interconnection to all information service providers, require open procurement by the BOCs, prohibit cross-subsidies, prohibit the tranfer of assets back to the rate base unless this would benefit customers and regulate transactions between BOC competitive businesses.

Another proposal by Rep. Ron Wyden (D-Ore.) would protect ratepayers in the event the BOCs are allowed to offer information services.

The measure (H. 3687) would require BOC competitive ventures to assume all direct costs of offering information services and would impose strict cost controls.

Tax from **page 1**

itability, but it will certainly change a company's cash flow.

"Users will have less money available to purchase equipment, and to spend on research, development and hiring," Rossman projected. "Long-distance carriers will eventually pass the new expense on to users. These companies may, at first, try to handle these costs themselves because the long-haul communications market is too competitive." This scheme would not last long, he predicted.

Companies that used tax credits and deferrals to pare their tax bills would have to begin paying higher tax bills in 1988 and 1989, Rossman said. He added that some large user companies could even be forced to borrow funds to pay the higher tax bills. "Do we even have enough banks to loan enough money to corporate America to pay these tax bills?" he asked.

Bruce Nolin, president of the Society of Telecommunications Consultants and a consultant with Arthur Young & Co., agreed that the loss of the investment tax credit would hurt long-haul carriers by limiting their cash flows.

"The loss of the investment credit does not provide users with much of an incentive to buy new equipment," he forecasted. "It will slow users' investments in their physical plants."

In addition to repealing the investment credit, Congress last week increased the tax levy on U.S. corporations, a move that could further slow capital spending.

While several industry analysts maintain carriers' plans to invest in their existing nets may be curbed by repeal of the credit, both AT&T and GTE Corp., one of two companies that owns US Sprint, are still assessing how the termination of the investment tax credit will impact future network investment and expansion plans.

AT&T said, in a prepared statement, "We still need to study further what the implications of [the loss of] the investment tax credit are before we can ascertain how it would affect specific investments."

Both MCI Communications Corp. and National Telecommunications Network (NTN) claim the loss of the investment credit will not substantially affect their communications networks plans.

"At present, we do not see any change in plans for the construction of our fiber-optic and microwave network," an MCI spokesman said. The spokesman added it is too early to determine if additional costs incurred as a result of the credit loss will be passed on to MCI service users.

Joel Malloff, marketing director for NTN, said the consortium's seven regional, fiber-optic carriers have already purchased most of the equipment needed to complete the 12,000-mile fiber system, which is due to be operational by the first quarter of 1987. "We don't expect the loss of the investment tax credit to affect NTN to any great degree," he maintained.

Joaquin Gonzalez, an analyst with the Stamford Conn.-based Gartner Group, a market research and consulting firm, said AT&T may be hit harder than other long-distance carriers by the elimination of the investment credit tax. "AT&T is using a lot of older equipment that hasn't been fully depreciated in its long-haul communications network," he said. "MCI and US Sprint have been doing much more construction of fiber-optic systems than AT&T."

Many users and industry associations aren't sure yet what the full impact from the loss of the tax credit will be. But Don Zook, president of the 82,000-member Society of Manufacturing Engineers (SME) and director of manufacturing for Caterpillar, Inc., said the elimination of the investment credit will make it more difficult for American corporations to compete with foriegn product manufacturers.

John Sodolski, president of the United States Telephone Association (USTA), said the loss of the tax credit dealt the telephone industry a heavy blow. "We would rather not have lost the investment tax credit, but things could have been far worse," he explained. "The telephone industry came out far better than the automobile and chemical industries."

▶ CWA

Workers return to RBOCs

BY NADINE WANDZILAK
Staff Writer

Some 50,000 members of the Communications Workers of America (CWA) returned to work last week after striking at three regional Bell operating companies, winding down the first postdivestiture contract negotiations between CWA and seven RBOCs and their local operating companies.

Some 500 CWA members continue their strike against the Ohio and Indiana publishing companies of Ameritech. CWA reached tentative agreement last week with Nynex Corp., Michigan Bell — an Ameritech telephone operating company — and with US West, Inc.'s publishing company. Earlier this month, CWA reached tentative agreements with Pacific Telesis Group, BellSouth Corp., Southwestern Bell Corp. and Bell Atlantic Corp. Each agreement is subject to a vote by the CWA members that it covers.

CWA reached agreement with Nynex after an nine-day strike. The tentative agreement, subject to a vote by all 37,000 members by Sept. 19, calls for a wage increase of 2.5% the first year of the contract and 1% in both the second and third years, as well as cost-of-living allowances, according to CWA spokeswoman Clara Allen.

If the proposed contract is ratified, a regional job bank will be established and training programs improved. A joint union-RBOC committee has been formed to study health care cost containment.

At US West, the US West Direct publication company reached agreement after a week-long strike. This agreement calls for 2% increases in each of three years, and includes job security measures. Workers at five US West companies struck for one day earlier this month before reaching agreements.

Details of the Michigan Bell agreement were unavailable at press time. Since last week, CWA reached agreement with Bell Atlantic without a strike. That agreement calls for annual raises in base pay of 2% for the first two years and 3% in the third year of the three-year contract, cost-of-living adjustments in years two and three and a $300 ratification bonus.

A $5 million, job security training fund and an intercompany job bank will also be created. The current medical plan will be retained at no additional cost to CWA members. Bell Atlantic workers are due to vote on the tentative regional contract by Sept. 20.

The two remaining units on strike at Ameritech are scheduled to bargain today. Economics is the main stumbling block, according to a CWA spokesman.

Not every communications company has its feet on the ground.

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If you've ever taken a close look at the crowd of suppliers who'd like to sell you a communications system, you've probably been left feeling a bit up in the air.

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Before your company gets roped in by someone else.

USWEST INFORMATION SYSTEMS

▶ LOCAL-AREA NETWORKS

Novell lands Aetna deal

Net maker beats IBM to $8m contract.

BY BOB WALLACE
Senior Writer

HARTFORD, Conn.— Aetna Life & Casualty Co. last week inked a pact with Novell, Inc. that calls for the local-area network producer to supply Aetna with its S-Net networks for 52 field offices scattered across the nation. The contract was valued at more than $8 million.

In related news, Aetna said it will soon begin a six-month, 15-city pilot test of the New York-based Private Satellite Network, Inc.'s (PSN) one-way videoconferencing service.

The Novell-supplied nets, which will be based on the company's Netware network operating system, will be linked via leased lines to an IBM mainframe at the company's headquarters here. The mainframe houses a central data base with billing support and other policy information. Novell reportedly edged out IBM in winning the lucrative Aetna contract.

Aetna's Commercial Insurance Division has developed a personal computer-based application designed to streamline commercial underwriting procedures. The network application supports field agents in the drafting of individual insurance policies.

Each of Aetna's Novell systems will feature between two and six 252M-byte 68B file servers, synchronous and asynchronous gateways and anywhere from 25 to 100 or more IBM Personal Computer AT workstations. Installation of the networks is scheduled to be completed some time in 1987.

If Aetna's one-way video pilot is successful, the company will expand the system to some 70 sites by 1987. The company already operates a two-way, videoconferencing network, and it tested a one-way system beginning in 1984. A downturn in the insurance business in 1984 and 1985 forced Aetna to delay its one-way video plans, noted Richard Jackson, corporate communications director for Aetna.

Jackson said one-way video services are an effective communications vehicle for large corporations with many geographically dispersed locations. "One of the applications we will test over the PSN system is training of administrative staff, who would normally have to be shuttled from California to Hartford and back for secretarial schooling," he explained.

"We are trying to convince the senior management of each of Aetna's three divisions that one-way videoconferencing is an effective communications tool."

Other applications to be tested include advanced training for life insurance staff, broadcasting presentations delivered by corporate officers to the company's field staff and delivering stock information to remote locations.

"We want to use videoconferencing to close the communications gap between our people in Hartford and our staff out at field offices," Jackson noted.

Aetna is not forcing videoconferencing onto its personnel, Jackson explained. "This represents a radical change in the way people currently train. We sold the concept to our trainers by saying, 'We do not want to upset how you train now, we just want you be able to provide services over the video system that you don't provide now.' "

Jackson said Aetna currently operates a self-contained television studio in its headquarters here and produces video programming for the company's two-way, video conferencing network. Feedback from users of the two-way, videoconferencing network was largely positive, Jackson said. ◪

Ulana from **page 4**

the specification from all major command bases. The specification is publicly available. To date, a number of other groups, including the U.S. Navy, and more than a dozen major systems integrators and equipment vendors have expressed interest in Ulana. Powis declined to identify the vendors.

"Everybody's interested in it, but I think they're waiting for us to shake it out a little more," he said.

As early as next year, the Air Force could start low-level requirement definition for Ulana II. Among other differences from Ulana I, Ulana II will provide for networking components based on anticipated International Standards Organization protocols. In addition, the Ulana I family of bridges will be expanded to include bridges to IEEE 802.4, 802.5 and 802.6 networks, and its family of gateways will be expanded to include gateways to emerging Integrated Services Digital Network standards. ◪

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INDUSTRY UPDATE

That name rings a bell...

Northwestern Bell Information Technologies has changed its name to US West Enterprises. According to President Bill Bauhard, the change was made "in conjunction with US West Enterprises' expanded role as the entrepreneurial business development arm of US West."

▶ ZTEL, INC.

PBX maker faces uncertain future

Work force said to be pared from 200 to 50.

BY BOB WALLACE
Senior Writer

WILMINGTON, Mass. — After six years and an investment estimated at $75 million, Ztel, Inc., a private branch exchange vendor based here, appears close to disintegration.

Network World has learned the embattled switch producer reduced its staff by 75% in the past month, a step hidden from the public eye. A former Ztel employee estimated the layoffs reduced the company's work force from 200 to 50.

Ztel, now reportedly for sale, boldly planned to manufacture a digital PBX with advanced voice and data switching capabilities.

The source, who asked not to be named, claimed Ztel officials have been trying to acquire additional capital from Data General Corp. of Westborough, Mass., and Telefone of the UK, as well as Samsung Semiconductor and Telecommunications Co. Ltd. of Seoul, South Korea.

Ztel representatives were unavailable for comment. It is unknown whether Ztel is involved in discussions that could result in another corporation purchasing the switchmaker.

Ztel may be forced to seek Chapter Seven liquidation proceedings if the company does not receive an infusion of capital or it is not purchased by another company.

Spencer Rice, president of the Madison, N.J.-based S & R Consultants Ltd., claimed Ztel faces a tall order in trying to market itself to other communications equipment vendors.

"If you look at the strong companies that are positioned well in the telecommunications industry, you will notice they already have their own PBXs," Rice said.

"What would they want with Ztel? These companies would certainly not buy Ztel, because they viewed Ztel as a threat."

Early warning signs

Rice claimed that Ztel's early management team and problems with software development for the so-called fourth-generation switch foretold the company's most recent troubles.

"Ztel's original management team was abominable," he claimed. Rice helped develop the Private Network Exchange (PNX) architecture, which he said was overambitious.

"The complexity of the PNX's architecture placed a heavy burden on the software development crew," he said. "The software problems were the downfall of the switch."

The beleaguered PBX producer originally planned to construct and market the PNX as software that could route data over a local-area network hitched to the unit.

The PNX's blue-sky capabilities includ the ability to connect multiple, physically separate, PNXs — a feature that would allow a PNX system to handle upwards of 30,000 lines. However, these concepts were never translated into actual equipment.

Two former employees estimated that Ztel currently has between 50 and 60 PNX installations, though these figures have been challenged by many.

Ian Angus, president of the Toronto-based Angus TeleManagement Group, Inc., said he believes the total PNX installation is far smaller.

"There is no way Ztel has 50 to 60 PNX installations," Angus said. "I have seen some of the user lists Ztel has circulated, and they have a habit of counting everything they have shipped, as well as everything they plan to ship in their total installations figures."

Disastrous beta testing

The company survived a nightmarish beta test at Compugraphic, Inc. It also weathered the removal of the PNX from one of Utah's state buildings in 1983. The PNX that Ztel slowly began shipping was a mid-range voice/data PBX.

The ailing firm filed for Chapter 11 of the Federal Bankruptcy Act on May 15, 1985, after squandering roughly $52 million in start-up capital. Ztel emerged from Chapter 11 when four of the company's five founders invested a total of $17 million in the firm.

The pullout of Adler & Co. — one of Ztel's original five founders — in May of 1985, weakened the firm. That action may have also caused prospective PNX users to scrutinize more closely the PBX maker's chances of remaining in an overcrowded market.

Ztel struggled to shed its negative image as the little switchmaker that couldn't by announcing six PNX installations at the Telecommunications Association conference in 1985.

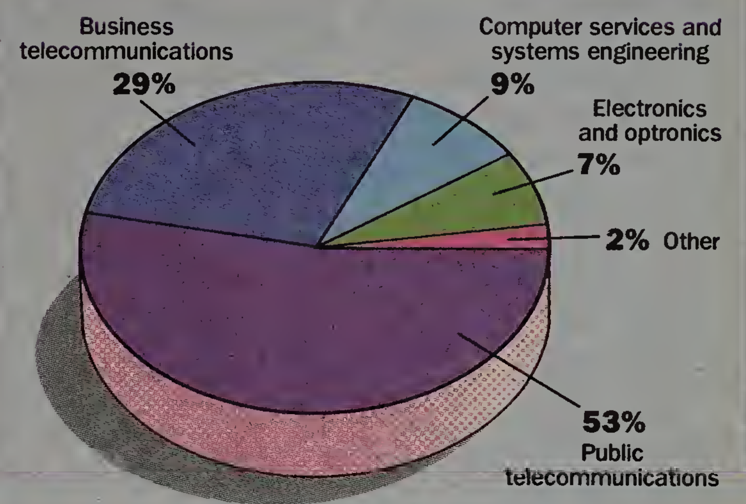
These PNXs represented roughly 1,350 lines, but with only 150 of them used to handle data.

But Ztel was slow to develop a nationwide distribution network for the PNX. The company's initial plan was to sign several of the regional Bell operating companies as resellers of the switch.

This plan was later scrapped in favor of a simple strategy that involved signing a series of small PBX resellers.

The future looks bright for France's Alcatel

1985 sales totals more than $3.4 billion



A division of France's Compagnie Generale d'Electricite, Alcatel now ranks as the world's fifth largest manufacturer of telecommunications equipment.

SOURCE: COMPAGNIE GENERALE D'ELECTRICITE, PARIS

CONTRACTS

BOXBOROUGH, Mass. — The **California Department of Justice** will buy 525 **NEC Information Systems, Inc.** Advanced Personal Computer III systems that will be linked to Sperry Corp. 1100 mainframes during the next five years under the terms of a $5.7 million agreement.

NEC will install a **Kantek, Inc.** Kannet local net and provide **Satellite Software International's** Wordperfect word processing package, as well as **Forumula Consultants, Inc.'s** Super/NEC UTS emulation package for the micro-to-mainframe link. In all, 25 vendors vied for the contract.

CUPERTINO, Calif. — **Convergent Technologies, Inc.** will market **Network Innovations, Inc.'s** Multiplex networking software under a two-year OEM agreement expected to net Network Innovations about $3 million.

Convergent will market Multiplex packages for its Miniframe, Mightyframe and Megaframe Unix-based computer systems. The package links personal computers to Convergent's Unify/E data base, **Relational Database Systems, Inc.'s** Informix-SQL data base, **Relational Technology, Inc.'s** Ingres data base, and **Oracle Corp.'s** Oracle data base.

SAN CARLOS, Calif. — The Farinon Division of **Harris Corp.** will build a 30-site microwave and multiplex communications network to link **Allegheny Power System, Inc.** facilities in Pennsylvania, Maryland and West Virginia. Under terms of the multimillion dollar agreement, Harris Farinon will build a voice/data network using its FAS and LR1-2 analog microwave radios and its UDL 634 analog multiplex systems.

MOUNTAIN VIEW, Calif. — **Sytek, Inc.** will install a broadband network to link computing systems throughout the 83 departments of the 1,000-bed **New York Hospital**. Under a two-year contract valued at $1 million, Sytek will use its System 2000, System 3000 and System 6000 lines of networking products to link the hospital's five mainframe and minicomputers, 45 asynchronous terminals and printers.

45 IBM Personal Computers and 64 light-pen equipped IBM 3278 terminals are also to be linked.

The network will carry data and video transmissions. Sytek and six other firms competed for the contract.

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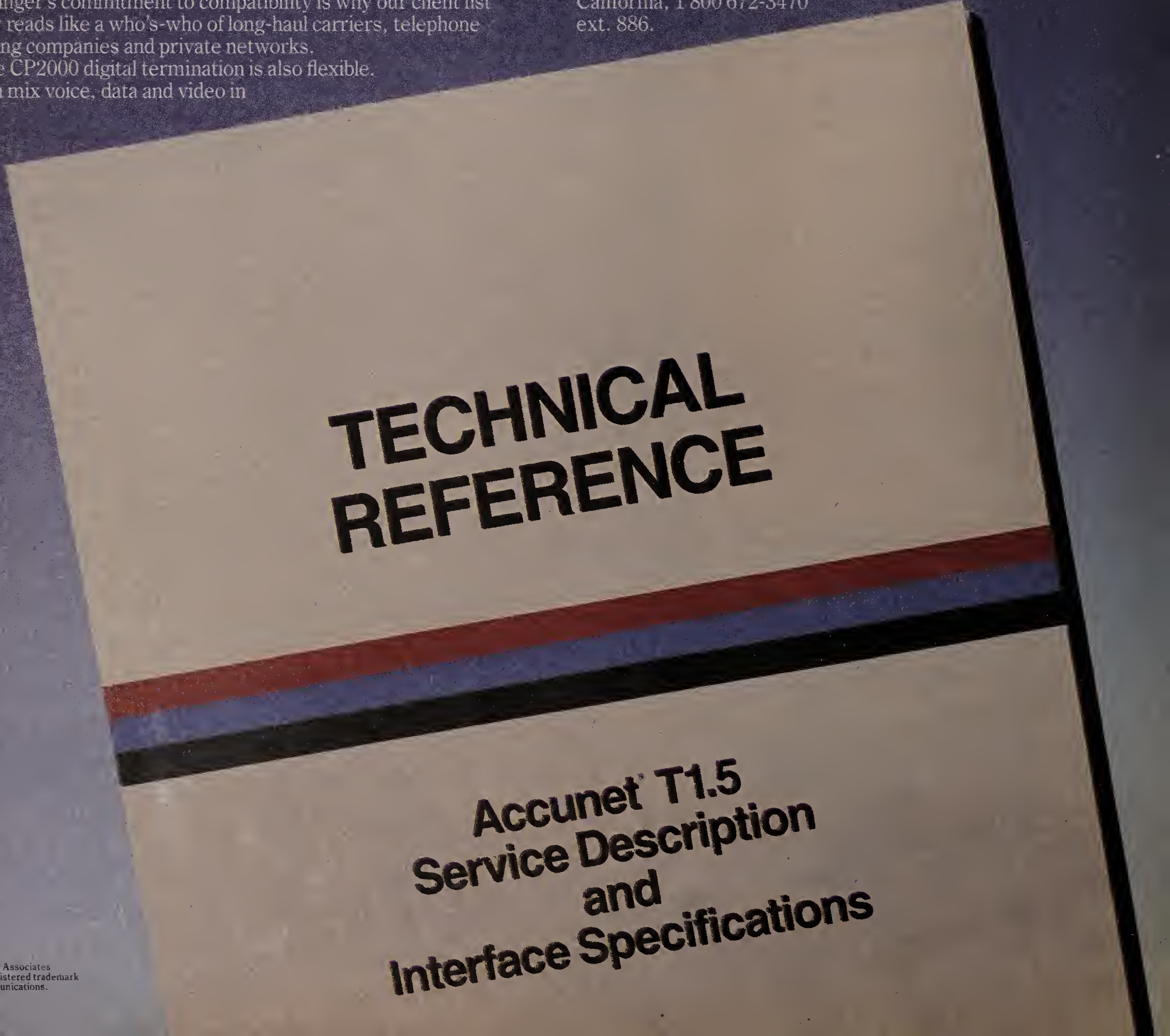

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TELECOM TRENDS

DMS-100 switch hits the great outdoors

Northern Telecom, Inc. recently unveiled an outdoor version of its DMS-100 switch module for its line of digital central office switches. The DMS-100 Outside Plant Module is housed in an environmentally controlled cabinet and can support as many as 640 subscriber lines. Maintenance and administration of the module can be performed by the remote host switch.

Industry use of transmit/receive and receive-only satellite earth stations

Industry	% 1984 shipments	% 1989 shipments
Transmit/receive		
Business	20	30
Common carrier	20	30
Wire service	15	10
Minicable	5	5
Radio	5	5
CATV	5	5
Network TV	15	10
Other	15	5
Total	100	100
Receive-only		
Business	10	20
Common carrier	5	10
Wire service	15	15
Minicable	15	15
Radio	15	10
CATV	15	10
Network TV	15	15
Other	10	5
Total	100	100

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

INTRALATA COMPETITION

Lata barrier falls

Missouri allows long-distance carriers to bite into the local telephone traffic business.

BY MARGIE SEMILOF
Senior Writer

JEFFERSON CITY, Mo. — Missouri recently became the 16th state to allow long-distance carriers to compete with incumbent local telephone companies for toll traffic within local access and transport areas.

The plan, approved by the Missouri Public Service Commission, will enable long-distance carriers such as MCI Communications Corp. and US Sprint Communications Corp., as well as a variety of communications reseller companies, to compete for the long-distance business within Latas. AT&T is barred from intraLata competition by the Modified Final Judgement.

According to William Steinmeier, chairman of the state Public Service Commission (PSC), at least 15 other states, including New York, Iowa and Illinois, have either authorized or are about to authorize such intraLata competition.

In Missouri, the measure does not permit competition within local exchanges. That traffic will still be handled by regulated local companies such as Southwestern Bell Corp., General Telephone of Missouri and Continental Telephone Co. of Missouri. However, users calling between local exchanges within a Lata will be able to choose among long-distance vendors.

Missouri currently has four Latas, three of which have their own area code. The fourth Lata surrounds a special market area in the center of the state which includes the state capital, Jefferson City.

Steinmeier said local carriers are firmly

See **Missouri** page 12

SERVICE BILLING

Users in two regions to pocket $8m in refunds

New England Tel credit call overcharges, high Michigan Tel revenue redressed.

BY MICHAEL FAHEY
Staff Writer

Users recently won two victories over local telephone companies in state-mandated refunds totaling nearly $8 million.

The Massachusetts Department of Public Utilities ordered New England Telephone and Telegraph Co. to refund some $2.6 million to customers whose credit card calls, listed at direct-dial rates, were incorrectly billed as operator-assisted calls.

The overcharges are said to have involved approximately 2.5 million calls made during October and November 1985, according to a department spokeswoman.

The overbilling was brought to the attention of the DPU in January by a user who contacted New England Telephone to complain about being billed at the operator-assisted rate rather than direct dial rate, the DPU spokeswoman said.

The company admitted its error and forwarded a refund to the customer. The customer then contacted the DPU to ensure that other users received refunds.

According to the DPU, New England Telephone has begun processing bill adjustments.

Michigan customers also save

In a separate case, General Telephone Co. of Michigan customers will save $5 million on their 1986 telephone bills. The savings are the result of a settlement between the company and the Michigan Public Utilities Commission.

The agreement follows a review by Michigan's Public Service Commission (PSC) of General Telephone's projected 1986 earnings. It had been undertaken to gauge the company's revenues against the permitted rate of return.

A PSC spokesman said the settlement would ensure that the company will not report excessive earnings this year.

The agreement calls for General Telephone of Michigan to refund each customer $5.62 this month. Furthermore, General Telephone must refund $1.30 per month per customer through December, the spokesman said.

CROSS TALK

JOHN DIX

AT&T and Centrex?

An AT&T insider called last week in reference to the Aug. 4 *Network World* story, "AT&T takes aim at Centrex," to say the story contained some truth but was a bit off the mark.

The insider admitted that AT&T is exploring the possibility of offering a Centrex-like service, but disagreed with contentions made about where and when.

The idea of AT&T pursuing Centrex customers has created a stir among the telephone companies that provide these services today. Centrex customers represent some of these companies's largest accounts. Besides lost revenue, any customer migration from Centrex would strand the telephone companies with capital investments in partially used central office switch equipment.

The brouhaha started over a prediction made by a consultant that AT&T would enter the Centrex business this month. Instead of supporting customers directly from central office switches in the traditional Centrex fashion, the consultant claimed AT&T would install slave switch modules at the customers' site.

While the switches would function much like a standard private branch exchange, the remote modules would be tightly coupled with an AT&T 5ESS central office switch. Besides functionally differentiating the switch module from a PBX, integration would enable AT&T to control and administer the customer premises equipment in typical Centrex style. Integration would also enable AT&T to bundle local support with long-distance services.

According to our AT&T source, who was not speaking for the company, although AT&T has a Centrex-like service in the works, it is not about to release the service. The AT&T insider said the company would probably pursue the matter on a case by case basis. Likely targets would be large customers that happened to be located near an AT&T network point of presence. The number of AT&T net interface points limits the potential user population, the employee said, adding it may take two years for the plan to come to fruition.

▶ SATELLITE UPDATE

New services abound

Four companies hawk satellite wares.

BY BOB WALLACE
Senior Writer

The skies are heating up with satellite service news, including these recent announcements:

- Vitalink Communications Corp. last week introduced a satellite-based product that makes it possible to interconnect scattered Ethernet-type, local-area networks to create what appears as a single network.

Satlan adds Ku-band satellite support to Vitalink's Translan, a network interconnect product that uses terrestrially based leased lines. The Satlan service supports data transmission at 1.544M bit/sec from the central hub station to remote earth stations and from remotes to the hub site.

- AT&T recently filed a tariff for its very small aperture terminal service with the Federal Communications Commission that would extend the signing deadline for long-term lease contracts, including options on multiyear fixed-rate transponder service contracts. If approved, the deadline for leasing space on the service would be pushed ahead to March 1987.
- GTE Spacenet Corp. recently awarded NEC America, Inc. a contract valued at more than $20 million that calls for NEC to provide 2,100 Vsats, the main hub station and a network control center for the data and video communications network GTE Spacenet is building for K mart Corp. The retail chain inked a $40 million pact with GTE Spacenet for a Vsat net K mart claimed will save the company $4 million to $5 million per year over its existing network.

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Missouri from **page 11**

entrenched in the intraLata market and the PSC was unsure whether or not new carriers would be able to take any of that market share. In addition, an increase in the number of companies vying for the local exchange market could dilute any one telephone company's share of the intraLata revenue pool.

The PSC was concerned that regulated local carriers may have to raise rates if they are unable to support their networks with that reduced pool of revenue. "We have been proceeding cautiously and deliberately so no local carriers get killed in the process," he said. "We wanted to make sure local exchange rates don't fly up dramatically."

Since the measure took effect, at least 15 resellers, such as Allnet Communications Services, Inc. and Contact America, have been given permission to compete within the Latas by the PSC. Steinmeier also expects MCI and Sprint to request permission to enter the intraLata market. "We set the stage to give those companies authority without having to prove [passing] the traditional test of public need," he said.

Steinmeier said nonregulated intraLata competitors will be allowed to make rate changes of up to 15% within a predetermined master rate schedule if they give 14-day notice.

Local operating companies are denied the same flexibility to change their rates, because they still control access to the network and have a virtual monopoly on intraLata service.

Steinmeier said the Office of the Public Council, a group representing the public in PSC proceedings, opposed the decision to allow intraLata competition. Douglas Brooks, public council for Missouri and Council representative, said, "Our feeling is that there just wasn't enough business in the intraLata market to allow for competition. We believe that if you open that market, the entrenched carriers will dominate."

The commission weighed the option of allowing resellers to compete while excluding facilities-based carriers, those companies with their own switching networks.

"The PSC decided they could not draw a clear line to make that distinction viable," Steinmeier said, "so we decided to allow competition regardless of whether a company is facilities-based or is a reseller."

Tom Spavins, deputy chief in the office of plans and policy at the Federal Communications Commission, said he doubted whether the measure would create any significant change in Missouri's intraLata market.

"Access charges are already very high, relative to the end-to-end toll call," he said. "About 80% or 90% of the long-distance carrier's revenue goes to the Bell operating company in access charges."

"It is nice to be able to compete for that 10%," he added, "but on most intraLata toll calls, there is not much money left [for other carriers] after access charges."

DATA DELIVERY

> “Present modem offerings do not have the capacity or capability to fulfill all of today’s business networking needs.
>
> **from “Evolution in Modem Technology”**
> International Data Corp.
> Framingham, Mass.

FRONT-END PROCESSORS

First NCR 5620 users grinning

Fewer trunks and savings result.

BY PAUL KORZENIOWSKI
Senior Editor

Two early users have found that NCR Comten, Inc.’s 5620 front-end processor fits their communications bills.

Both Continental Baking Co. and Montreal Trust claim that the remote front-end processor has saved them a lot of money.

The NCR box saved Continental close to $100,000, according to Michael Chiapperino, senior technical support analyst for communications at the company.

In April 1985, Continental decided to install a front-end processor at its Stamford, Conn., data center. The company had been using NCR 3670s, in place of IBM 3705 models, at its other data centers for the past few years.

Last year, the company decided that a front-end processor was needed to support an IBM 4381 mainframe being used in Stamford for the company’s Connecticut operations.

Continental was leaning toward an NCR 3650 when the NCR 5620 was announced. The new device attracted the firm’s attention because it could be installed easily.

The NCR 3650 would have required the company to make changes in its computer operations room. In order to support the 3650, Continental would have had to install a raised floor, special power supplies and additional air conditioning.

Continental opted for a beta version of the new box, and it was delivered last September. The device was replaced by a production model when the product began to be shipped last February.

The new device supports more than 60 users at 50 Connecticut locations. Users are tied to the central site by point-to-point modems transmitting at a speed of 9.6K bit/sec.

Continental is satisfied with the 5620. Chiapperino said the only problems encountered with the front-end processor were ones typically found in beta tests.

The company likes the architecture of the 5600 line. The new line allocates bandwidth more efficiently than earlier models, according to Chiapperino.

Last fall, Montreal Trust was searching for a front-end processor to connect three branch offices to its central processing site, which runs an IBM 3083 mainframe. The remote sites had been running a

See **NCR** page 14

INFORMATION DELIVERY

Industry giants launch second videotex wave

BY NADINE WANDZILAK
Staff Writer

NEW YORK — The second wave of videotex service offerings is now hitting the market. Suppliers hope to make a bigger splash than than the first wave made.

Covidea, a joint development formed by AT&T, Chemical Bank, Time, Inc. and Bank of America, has broadened its videotex offerings and given its information and transaction network a name — Target. The nine-month-old firm will add brokerage and news print information services to it.

The day after Covidea announced its Target network, Integrated Communications Systems, Inc. of Atlanta announced the testing of an interactive network, Transtext, that provides stock market services. The service is being developed in conjunction with Merrill Lynch & Co. and is being tested in the Roswell, Ga., area.

See **Video** page 14

DATA DIALOGUE

GABE KASPEREK

Network control center structure

The Network control staffs function most efficiently when they are divided into a hierarchy.

A hierarchy should be able to handle the common network problems. Network control center staff note problems reported by end users and then filter the problems to the appropriate person for quick resolution.

Each layer has distinct responsibilities, which are interwoven with services from the layers above and below.

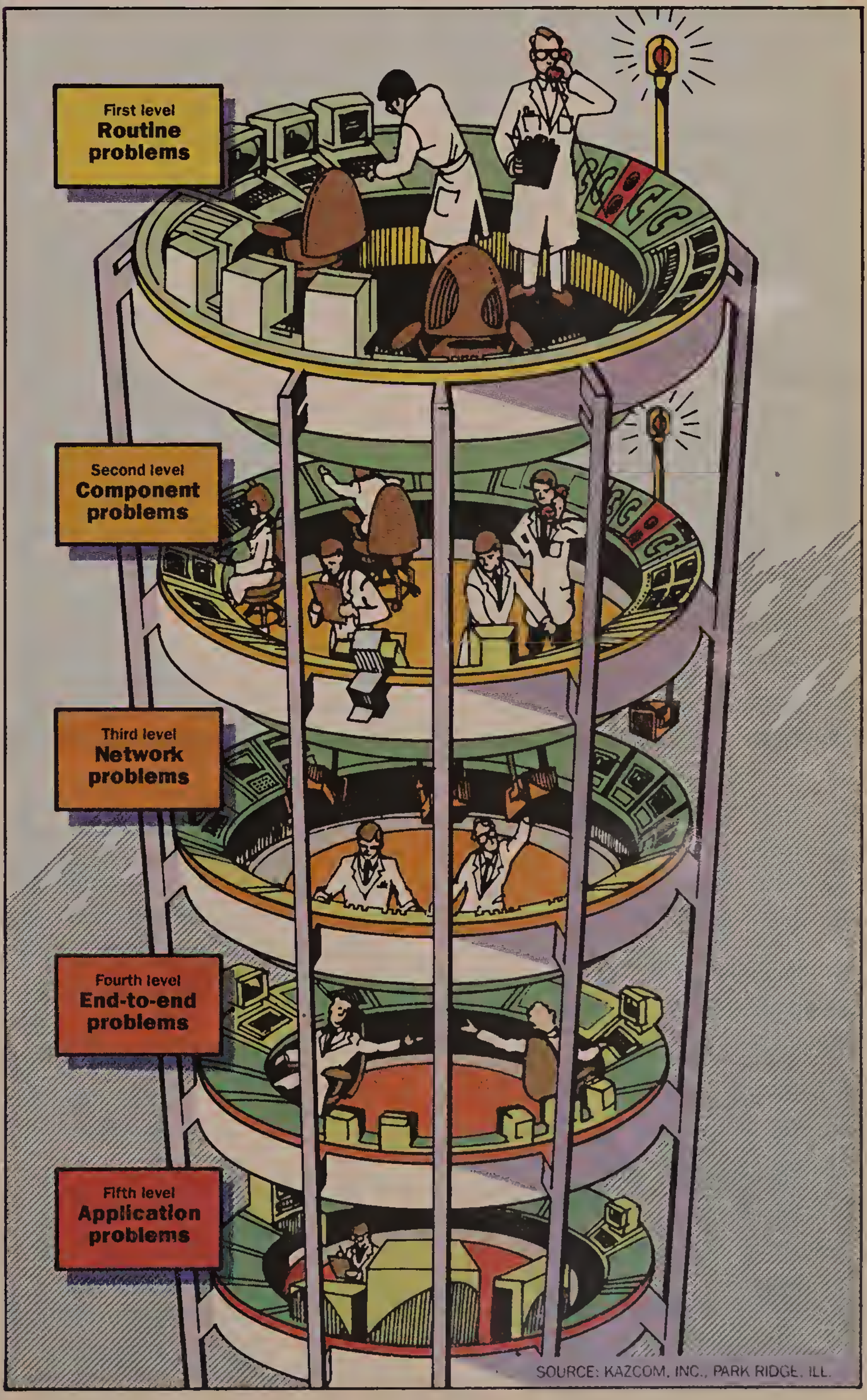
The most important group is the help desk, for it is the first point of contact for end users. If the help desk cannot provide the end user with positive feedback, he may decide to bypass the hierarchy completely, which can create problems for everyone running a network.

Whenever a problem is solved by levels beyond the help desk, personnel at those levels should inform it, so it can, in turn, inform the end user when the problem again arises. This procedure takes advantage of the help desk’s skills and reinforces the process of end users contacting a help desk first. Help desk personnel do not require technical skills. With the proper tools, technical neophytes can

See **Hierarchy** page 14

Kasperek is president of Kazcom, Inc., a Park Ridge, Ill., network management consulting firm.

Where the buck stops



SOURCE: KAZCOM, INC., PARK RIDGE, ILL.

Hierarchy from **page 13**

make this first level work. Chief requirements are people skills and a grasp of the common problems end users face.

Common problems

Common problems, which make up perhaps as much as 80% of network problems, include simple items such as a screen not bright enough to see various characters or a lack of logon instructions.

Once help desk personnel have verified that a problem is not routine, they should pass it to the next layer.

Second-layer staff members must understand system components and their basic functions.

They must also have the skills to complete basic hardware troubleshooting. They must be able to use techniques such as loop-back testing and bit error rate testing to detect faulty pieces of equipment.

Approximately 17% of network problems are resolved at this level. As network control tools become more sophisticated, Levels 1 and 2 will be integrated into a single level.

The remaining 3% of network problems are taken up by the other three levels. Problems that reach this stage are serious and may require a meeting with end users so that the problem can be better defined and procedures can be established for testing and resolving the difficulty.

The upper three levels all require technical expertise. Level 3 deals with problems with either network hardware or software.

For example, a faulty modem or packet assember/disassembler may be the problem. Personnel at this level should be able to isolate software problems within the data link and network layers in a typical network model.

Level 4 deals with full end-to-end transmissions, a function that corresponds to the Transport Layer of the Open Systems Interconnect model.

Personnel at this level should be able to locate problems such as a faulty connection between a terminal and a front-end processor.

Level 5 personnel deal with host applications and the interfaces used to connect a host to a network. Problems at this level could stem from the application software itself.

Staff members at each of these last three levels should devote most of their time to system analysis, programming and design functions.

The problems that filter to these levels are often so important that these staff members must be taken away from their daily assignments.

> *“It is often difficult for a company to determine when a technician should be moved from a job.”*

It is often difficult to determine when a technician should be moved from a current assignment to resolve a network problem.

It also can be difficult to determine when a problem should be handed from one level of support to the next level of support. A data base can assist a company in making these selections.

Alarm thresholds

Alarm thresholds can be set and stored in a data base. Whenever a threshold is reached, an alarm will notify the staff member and the supervisor at the next level. The higher level personnel can then begin to resolve the problem.

In addition to organizing responsibilities, a hierarchy provides a career path for staff members. They can visualize career paths and determine in which direction they want to move.

They may opt to master another technology in order to move to another level or to become a supervisor within a specific level.

Video from **page 13**

Transtext can also manage home utilities, according to Integrated Systems, by programming home heating and cooling systems to respond to a variable rate from Georgia Power Co. The demonstration will continue through December.

Pioneers

Earlier this year, two videotex pioneers, Times Mirror Co. and Knight-Ridder Newspapers, Inc., gave up on their videotex experiments after reportedly suffering substantial losses. Both systems offered electronic banking, shopping and ticket buying as well as news.

At that time, analysts said the public was not ready to use and pay for videotex services. They recommended that companies target their audience more narrowly and offer less expensive technology. Videotex terminals were then priced around $600.

Covidea perceives itself as very different from either of those first-wave videotex services, according to Kathleen Lobb, Covidea's manager of public relations. The Times Mirror and Knight-Ridder projects were both single-industry undertakings launched as a defensive strategy, she said. Covidea is also targeting its audience more narrowly than either of its competitors, she said.

Another advantage is that Covidea is working with a text-only system, which is less expensive than the full color and graphic systems used by the other suppliers. Subscribers can access Covidea's network via a personal computer used with a modem and telephone or an 1300 terminal, which costs less than $100.

Covidea will add the Investment Edge information and on-line discount brokerage service to its Pronto home banking and Pronto Business Banker service for small businesses. The Pronto service was introduced in the early 1980s and distributed by Chemical Bank in New York and Union Trust in Connecticut. A simiilar service, called Homebanking, is available through Bank of America in California. Bank of America's participation in the Covidea lineup is subject to regulatory approval.

The company also plans to add New York Pulse, entertainment and leisure information, as well as news and sports drawn largely from *The New York Times* and financial tips and advice from *Money* magazine in Money Online. New York Pulse was developed by New York Videotext, a subsidiary of The New York Times Syndication Sales Corp. That offering has been market tested in metropolitan New York, its target area, since late May, according to Covidea. Money Online was developed by Time, Inc.

Covidea has unbundled its videotex services, allowing customers to subscribe to one or more Target services. Home banking subscribers can access an on-line demonstration starting Aug. 26. The Investment Edge will be available to current Pronto and business banker subscribers on Sept. 12. Current subscribers will retain their identification or code names to access the Target network.

A subscription to both Pronto and Investment Edge is $4 per month plus usage charge. The fee for the Investment Edge alone is $8 per month, plus usage charge. Usage charges are 40 cents per prime-time minute, from 7 a.m. to 6 p.m. Monday through Friday, and 14 cents per minute off-peak. Partial minutes are rounded to the next whole minute. Money Online will be offered free to Pronto subscribers.

> *“Covidea plans to add leisure information and news and sports.”*

Are users more ready for videotex services today? The parties in the Covidea partnership understand the evolutionary nature of videotex, according to Lobb. The company does not expect user acceptance overnight, but it hopes for a positive reaction to its offerings.

NCR from **page 13**

number of on-line CICS applications supported by IBM 3270 series terminals. Users had been using dedicated digital lines to access the host.

The company wanted to consolidate its traffic and eliminate some of the dedicated lines. Montreal Trust thought that a front-end processor would help it accomplish that task.

The bank looked at an IBM 3725 front-end processor as a possible replacement but deemed the device too large.

“If we wanted to properly back up the 3725, we would need another 3725,” noted John MacMartin, data processing services manager at the bank. “That would be a very expensive proposition.”

Instead, the company puchased five NCR 5620s. One front-end processor is used at each Toronto, Calgary and Vancouver branch office. The central site operates one front-end processor and has a second for backup.

With the new front-end processors, the company cut the number of dedicated trunks from 20 to seven. MacMartin estimated that 30% of the company's telecommunications bill has been pared off.

He added that the devices, which cost more than $200,000, will pay for themselves in less than 18 months.

> *“The devices will pay for themselves in less than 18 months.”*

The bank ordered the devices in November of last year, and they were installed in the first quarter of this year. Like Continental, Montreal Trust reported few problems with the new products.

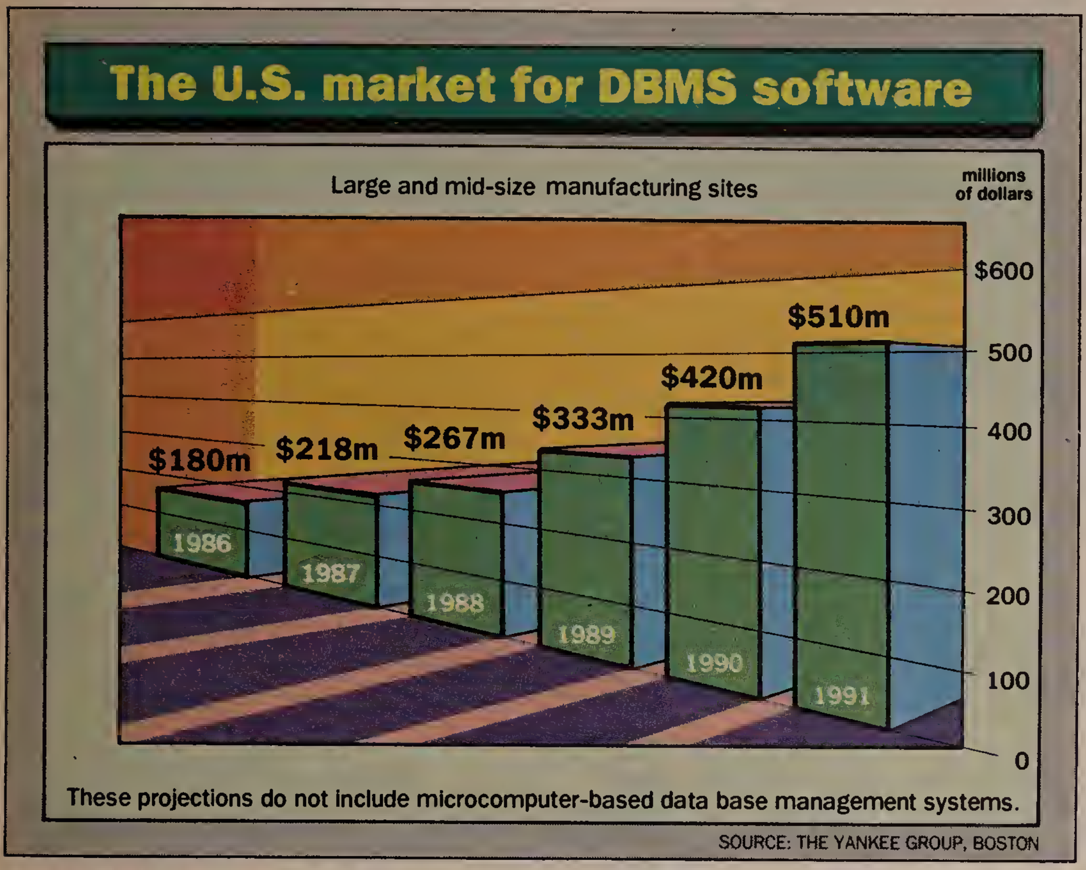
“One problem was training since our staff had been working with only IBM equipment,” MacMartin said. “We've become more expert as we've used the product,” he added.

Montreal Trust would like to see NCR add another member to its 5600 front-end processor line. MacMartin estimated that the bank's central device is operating at close to 90% capacity. “We may run into some problems if we add a lot of lines to our network,” he said.

In May, NCR announced a high-end model, the NCR 5660. MacMartin said that the device, which supplies more than four times the storage of the IBM 3275, did not meet the bank's needs economically.

FACTORY COMMUNICATIONS

> ❝ ITI focuses on providing technology that will one day make communications, like electricity, a utility in manufacturing facilities.
>
> **Andy McMillan**
> Acting director
> Industrial Technology Institute's
> Communications Network Laboratory
> Ann Arbor, Mich.



These projections do not include microcomputer-based data base management systems.

SOURCE: THE YANKEE GROUP, BOSTON

FACTORY FACTS

BOB WALLACE

The future still awaits

General Motors Corp.'s Factory of the Future plant is still that — a factory that will not be completed until sometime in the future.

GM claims it does not know when the Saginaw [Mich.] Steering Gear, dubbed GM's Factory of the Future, will be brought on-line. Details on how the broadband, MAP local-area network will figure in the plant's overall functions are unclear.

GM claims the plant is, at most, 60 days behind schedule and has dismissed the assertion that the plant was originally due to be operational in February of this year.

Although the plant will feature some 55 manufacturing cells, it is dwarfed by the automaker's three-plant Manufacturing Automation Protocol project, referred to as GMT 400, or Truck and Bus.

The Truck and Bus project will feature networks compatible with MAP Version 2.1 in GM's Ft. Wayne, Ind., East Pontiac, Mich., and Oshawa, Ont., plants. GM contends all three of the Truck and Bus plants will be on-line before the Factory of the Future plant.

Each Truck and Bus manufacturing facility is larger than one million square feet, while the Factory of the Future plant — part of a seven-plant GM complex in the city — is roughly 70,000 square feet in size.

GM has made numerous claims about the future capabilities of the Factory of the Future. First, the MAP portion of the network is totally automated. Factory staff will only be used to monitor and maintain the network.

Second, GM says plant personnel will be able to implement changes in the factory's parts production in only 15 minutes.

Finally, GM maintains that the factory floor network will be linked to the plant's computer-aided design network in 1987. This task, once completed, would bring the plant close to having a Computer-Integrated Manufacturing facility.

None of the four plants uses Technical and Office Protocol-compatible nets in their design areas. There are no carrier-band networks in the Factory of the Future plant. Carrier-band systems are subnets that operate at either 1M bit/sec or 5M bit/sec.

These nets link such devices as robots, computer numerical controllers and other factory line gear to the broadband backbone net.

The absence of both TOP and carrier-band nets in these plants can be attributed to the fact that specifications for these two kinds of nets were either not available or not matured in time to be incorporated into the projects.

▶ MAP TESTING

Factory net befuddlement

Industrial Technology Institute working to define MAP-compatible.

BY BOB WALLACE
Senior Writer

Question: ITI is . . .

A) A learn-to-drive a tractor trailer school advertised late at night on UHF stations.

B) An obscure electrical interface.

C) The name of a company that manufactures local-area nets for industrial applications.

D) None of the above.

If you chose A, you're spending more time watching television than watching your factory floor. If you chose B, you're spending more time in the plant's wiring closet than you are on the assembly line. If you chose C, you're getting warm and are probably a member of what is best termed "the confused majority."

The confused majority comprises factory network users who have heard of the Manufacturing Automation Protocol but are uncertain what it is, what it does and how it how it can help them.

At the Industrial Technology Institute (ITI) in Ann Arbor, Mich., more than 120 network testing technicians and researchers are laboring to define what exactly a MAP-compatible product is. The nonprofit ITI has been referred to as the factory equivalent of the electrical appliance industry's Underwriters Laboratory.

The group tests equipment produced by numerous vendors to see whether it conforms with the seven layers of the constantly evolving

See **ITI** page 16

INCIDENTALS

A seminar on world-class manufacturing, entitled "Just-In-Time with Total Quality Control: The Lessons Learned to Date," will be held in San Jose, Calif., on Sept. 18 and 19.

The conference will focus on Just-In-Time, a zero-inventory system. For more information on the seminar, contact Management Research Corp. at (303) 494-2314.

*

A pair of automotive manufacturing seminars sponsored by the Society of Manufacturing Engineers (SME) will be held at the Sheraton Oaks Hotel in Novi, Mich. Lasers in Automotive Manufacturing will be held Sept. 23 and 24; Tracking Robotic Application Trends in Automotive Manufacturing will be held Sept. 25 and 26. For more details, contact SME at (313) 271-0039.

*

SME has announced that the 1986 World Congress on the Human Aspects of Automation will be held at the Hotel Queen Mary in Long Beach, Calif., on Sept. 22 through 24. The conference is sponsored by the Computer and Automated Systems Association of SME.

Focusing on the theme "Progress and Profits," the congress will examine the impact of technological change on manufacturing.

It will also probe enhanced use of human resources for an improved competitive edge and higher profitability.

For additional information on the conference, contact SME at (313) 271-0777.

*

SME also announced the availability of a new microcomputer software package that reportedly simplifies the evaluation and justfication of industrial robots.

Robot Calc II is a large data base directory containing information on hundreds of industrial robots, more than 100 major robot manufacturers and associated suppliers, robot terminology and robot selection analysis.

The directory also provides information on use in a user-friendly, computerized format with an IBM Personal Computer or Personal Computer-compatible unit. For more information on Robot Calc II, call Jill Bova at (313) 271-1500, ext. 416.

See **Incidentals** page 17

ITI from **page 15**

MAP specification. This is known as MAP conformance testing. ITI also tests factory floor equipment to determine if Vendor A's broadband modem can operate with Vendor B's broadband network headend remodulator. This type of testing is commonly referred to as interoperability testing.

Andy McMillan, acting director of ITI's Communications Network Laboratory, has worked to develop a series of tests that can be used to determine which vendor products comply with MAP and which are imposters.

Network World *senior writer Bob Wallace interviewed McMillan about the testing functions ITI performs daily.*

When and why was ITI created?
The state of Michigan assembled a task force to explore a series of issues related to the well-being of the nation's manufacturing industry. ITI grew from the study's findings, which recommended the creation of a group like ITI that would help speed the adoption of new manufacturing technologies.

How is ITI involved in the MAP effort?
One of our three activities here covers MAP conformance testing. ITI is represented on a number of standards groups, such as the American National Standards Institute and the Institute of Electrical and Electronics Engineers. ITI is a member of [General Motors Corp.'s] MAP Task Force. Our group also sponsors a manufacturing communications workshop regularly.

> *“The state of Michigan assembled a task force to explore a series of issues related to the well-being of the nation's manufacturing industry. ITI grew from the study's findings.”*

What's involved in MAP conformance testing?
Typically, a vendor will bring a product here, and we connect it to our broadband cabling system and test the product, one layer at a time, for conformance with MAP. Testing each layer may require 100 to 250 individual tests. We can't just plug a product into the network, push a button and have either a pass or fail light flash.

Last winter many vendors were releasing documents that claimed their products had been tested for interoperability with another vendor's product — then all talk of interoperability stopped. What happened?
This activity has pretty much stopped. We have shifted our testing focus from interoperability testing to conformance testing. The vendors testing for interoperability were simply trying to gain confidence in their product's interpretation of the MAP specification.

> *“We connect it to our system and test the product, one layer at a time, for conformance with MAP.”*

ITI offers manufacturing consulting services in addition to its staple testing fare. What are the most frequent manufacturing questions you and your coworkers are asked here?
The most common question I am asked by users is, “Do I need MAP; is MAP the answer to my problems?” We help our clients review the objectives of their manufacturing systems.

We view MAP as a communications tool that can be implemented to help users integrate their factory systems. We also are asked such questions as, “How can I migrate from what I have today to what MAP will offer in future years?”

What can users do to understand such issues as MAP conformance testing?
These users must first become educated users. Users who are not educated about MAP may be taking large risks by implementing MAP equipment. I strongly recommend that these users join the MAP/TOP users group.

What efforts are being made by

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* Limited supply available.

ITI from **page 16**

ITI to make understanding MAP easier for users?
At present, ITI uses a rigorous testing procedure to determine whether a product conforms with MAP. GM is the only company that uses identical procedures. By year end, we hope to be able to offer all our testing capabilities through a Sun [Microsystems, Inc.] workstation for a nominal fee.

Our intent is eventually to have all MAP users using the same test tools in their research laboratories as we have here.

How will the Corporation for Open Systems (COS) figure in ITI's future factory network testing plans?
I will be working with COS to help it establish its MAP testing program. ITI already has a contract to provide COS with test software that will enable it to perform MAP 2.1 conformance tests. I think COS may be thinking of waiting to perform MAP conformances testing on products compatible with [the yet-to-be-announced] MAP 3.0.

What other factory systems areas does ITI handle?
We have an entire group of people that work on distributed factory software. Their function is to work through some of the research problems associated with distributing systems in a single plant. We have to take advantage of the fact that many plant floor devices have intelligence and are capable of communicating with one another. One of the biggest challenges is, how do you devise scheduling and control algorithms that would work in a distributed factory environment?

What areas does the third group in ITI deal with?
The third group is working on distributed degradeable systems. These are systems whose processes reside on different host computers. These systems are degradeable in the sense that such a system could still operate if one or more of the network nodes were not operating.

INCIDENTALS

Incidentals from **page 15**

products, recently announced it had signed a number of value-added resellers to market the companies' products internationally.

These companies include Network Solutions Australia Pty. Ltd., Australia; Dataconsyst S.P.A, Italy; EB Information Systems, Norway; Simac Electronics b.v., Netherlands and Belgium; and Information Technology Ltd and CHA Networks Ltd., both headquartered in the UK. Other Chipcom value-added resellers include Bynet Data Communications, Israel; XMIT AG, with offices in Switzerland and West Germany; Sytek LAN Systems Ltd., Canada; and Tecno T & G, Spain.

Chipcom manufactures a variety of products designed to operate on broadband Ethernet local-area networks. The gear is reportedly compatible with the IEEE 802.3 local-area network standard.

*

Statistics hounds will want to know that 3,632 people attended Automach, a conference and exposition held in Sydney, Australia, on May 26 through 30.

The show featured the first Manufacturing Automation Protocol exhibit on the continent. In 1987, the show will be held in Sydney on July 7 through 10.

MAP/TOP MEETINGS

The following is a partial list of Manufacturing Automation Protocol, Technical and Office Protocol and related meetings. This data has been supplied by the Industrial Technology Institute (ITI) of Ann Arbor, Mich.

Aug. 26-28
Ansi X3S3.4
Speaker: J.W. Conrad
Location: San Jose, Calif.
Sponsor: Ansi
Contact: J.W. Conrad
Conrad Associates, Inc., (714) 662-7727

Aug. 28
Ansi X3T5
Speaker: Jerald Foley
Location: Washington, D.C.
Sponsor: Ansi
Contact: Jerald Foley
Electronic Data Systems Corp. (313) 492-3202

Aug. 28
MAP Programmable Devices
Speaker: John Tomlinson, committee chair
Site: GM Tech Center
Location: Warren, Mich.
Sponsor: MAP Task Force
Contact: John Tomlinson
General Motors, (313) 492-1590

Sept. 5
MAP/TOP Testing Committee
Speaker: Mark Adler, committee chair
Sponsor: MAP Task Force
Contact: Mark Adler
General Motors, (313) 575-1585

Sept. 8
ISO TC 97/SC 21/WG 1
Speaker: Hubert Zimmerman, committee chair
Locaton: Egham, UK
Sponsor: ISO
Contact: Hubert Zimmerman, CNET-PAA/TIM, Telex 250-317

Sept. 9, 10
SMC
Speaker: Mary Ann Grey, committee chair
Location: New York, N.Y.
Sponsor: Ansi
Contact: Mary Ann Grey, IBM, (919) 697-7224

Sept. 9-17
ISO TC 97/SC 21/WG 2
Speaker: Juergen Schouenhut, committee chair
Location: Egham, UK
Sponsor: ISO
Contact: Juergen Schouenhut, Friedrich-Alexander, Telex D 629-755-TF-E

Sept. 10-18
ISO TC 97/SC 21/ WG 6
Speaker: Paul Bartoli, committee chair
Location: Egham, UK
Sponsor: ISO
Contact: Paul Bartoli, AT&T Information Systems, (201) 949-5965

Sept. 11, 12
ISO TC 184/SC 5
Speaker: Walter Kozikowski
Location: London
Sponsor: ISO
Contact: Walter Kozikowski, (202) 457-1983

Sept. 15, 16
IAC
Speaker: Joseph Deblasi, committee chair
Sponsor: Ansi
Contact: Joseph Deblasi, IBM, (914) 697-7280

Sept. 15, 16
MAP/TOP users group meeting
Site: University of Michigan League
Location: Ann Arbor, Mich.
Sponsor: Society of Manufacturing Engineers
Contact: (313) 271-1500

▶ DEC

Expanded memory paired with price cut

VAXstation now has 5M-byte memory.

MAYNARD, Mass. — Digital Equipment Corp. has announced an expanded 5M-byte memory and price cut for its color and gray-scale four-plane VAXstation II/GPX workstations. Both VAXstations originally featured 3M bytes of memory.

The color four-plane VAXstation II/GPX is $25,995, down from $35,000.

The gray-scale version is $24,995, down from $33,000.

In addition, DEC's color eight-plane model is offered in an expandable enclosure for $39,950, according to a spokesman.

The eight-plane model also features a minimum of 5M bytes of memory.

DEC also introduced a workstation tablet option, which allows freehand drawings or digital input to be entered into a VAXstation II workstation.

Targeted for computer-aided design and manufacturing (CAD/CAM) applications, the digitizing tablet sends X and Y coordinates to a computer to indicate the position of a stylus or cursor on the tablet's surface. It does so to an accuracy of .005 inches, the spokesman added. The vertically adjustable tablet is $995.

Third in DEC's trio of announcements was the signing of an OEM contract with McDonnell Douglas Corp. to provide CAD software for the VAXstation II/GPX workstation and MicroVAX II and VAX 8000 computers.

Unigraphics II is McDonnell Douglas' mechanical CAD software package.

As an OEM, McDonnell Douglas is expected to make purchases totaling $5 million worth of VAXstations during the first year of the agreement.

Digital Equipment Corp., 2 Iron Way, Maynard, Mass. 01754.

▶ HEWLETT-PACKARD

CAD application design workstation announced

PALO ALTO, Calif. — Hewlett-Packard Co. announced an interactive-speed technical workstation designed for mechanical engineering computer-aided design applications.

The HP 9000 Model 320SRX can reportedly render solid images some 10 to 20 times faster than similarly priced workstations because of its architecture, custom very large-scale integration chips and hardware and microcode capabilities. HP designed graphics-rendering tasks directly into microcode and hardware.

In developing the 320SRX, the goal was to give design engineers who are using solid modeling an interactive response similar to what they expect today from wire-frame applications.

The system features 1,280- by 1,024-pixel resolution on a 60-Hz, noninterlaced display with four graphics, or alpha overlay, planes, expandable to 32 planes of graphics memory.

Model 320SRX includes the HP-UX operating system, which adheres to AT&T's Unix System V interface definition, and the Starbase graphics library.

The Model 320SRX costs $45,800. Each additional eight planes of memory costs $4,000.

For more information, see HP's listing in the telephone directory White Pages, or write: Inquiries Manager, Hewlett-Packard Co., 1820 Embarcadero Road, Palo Alto, Calif. 94303.

▶ INTEGRATION

CIM-based system smooths the flow of the factory

BY NADINE WANDZILAK
Staff Writer

ELK GROVE VILLAGE, Ill. — Cimlinc, Inc. recently announced a Computer-Integrated Manufacturing (CIM) system aimed at integrating islands of automation within a factory.

The Power CIM package automates and integrates the entire manufacturing process, from design through production.

Power CIM is a two-part package of modular workstation and integrated software applications. Cimlinc claims the communications links in Power CIM are multivendor-compatible and they eliminate networking and integration barriers.

The workstation communicates with equipment of all major computer-aided design and manufacturing (CAD/CAM) and factory machine tool vendors. Each workstation includes an intelligent local-area network controller subsystem that connects the device to the CIM information network.

The system complies with such standards as Ethernet, Intel Corp.'s Multibus and the Manufacturing Automation Protocol. A standard workstation includes a 19-inch monitor, high resolution graphics (1,024 by 792 pixels), a minimum of 4M bytes of random-access memory, at least 86M bytes of hard-disk storage and an upgraded CIM CAD, Cimlinc's CAD software and networking equipment.

The workstation, which uses AT&T Unix operating system Version 4.3, includes a separate I/O 68K-based processor that improves data throughput in the main microprocessor by off-loading communications functions. Using Motorola, Inc.'s 32-bit 68020 microprocessor, the new workstation is three to five times faster than Cimlinc's previous 68K-based system, the vendor claimed.

The Power CIM Modular Machine workstation is designed for office use; the Machine Manager workstation, with identical architecture, is designed for the factory. The factory version is protected from industrial contaminants by a sealed cabinet. The enclosure meets NEMA-12 specifications.

Among the new software products are CIM SOLID I, a 3-D modeling tool; Intelligent Documentation, a text and graphics document system for preparation; Avatar, an extension of CIM CAD that allows parametric design; and CIM COMM: SNA 3270, which enables the system to communicate with an IBM 3270 host system.

The company has upgraded several software packages and expanded its CIM Vendor line of customized interfaces for different factory automation systems.

A standard monochrome workstation, including an 11-slot Multibus card cage and floppy disk, is $11,990. A similar version with color display is $15,990. CIM CAD is priced at $3,995; CIM COMM:SNA 3270 at $12,495; CIM Solid I at $2,995; CIM Intelligent Documentation at $3,995; and Avatar at $2,495. CIM vendor prices vary.

Cimlinc, formerly Cadlinc, was able to lower the cost of a workstation-plus-software system from $50,000 to $16,000 by reducing the number of boards, redesigning the system packaging and increasing production volume.

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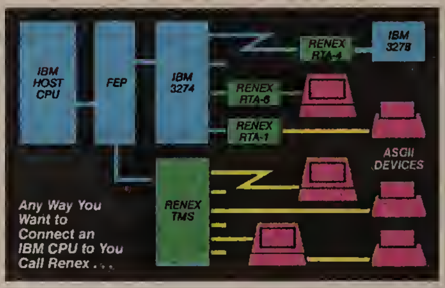

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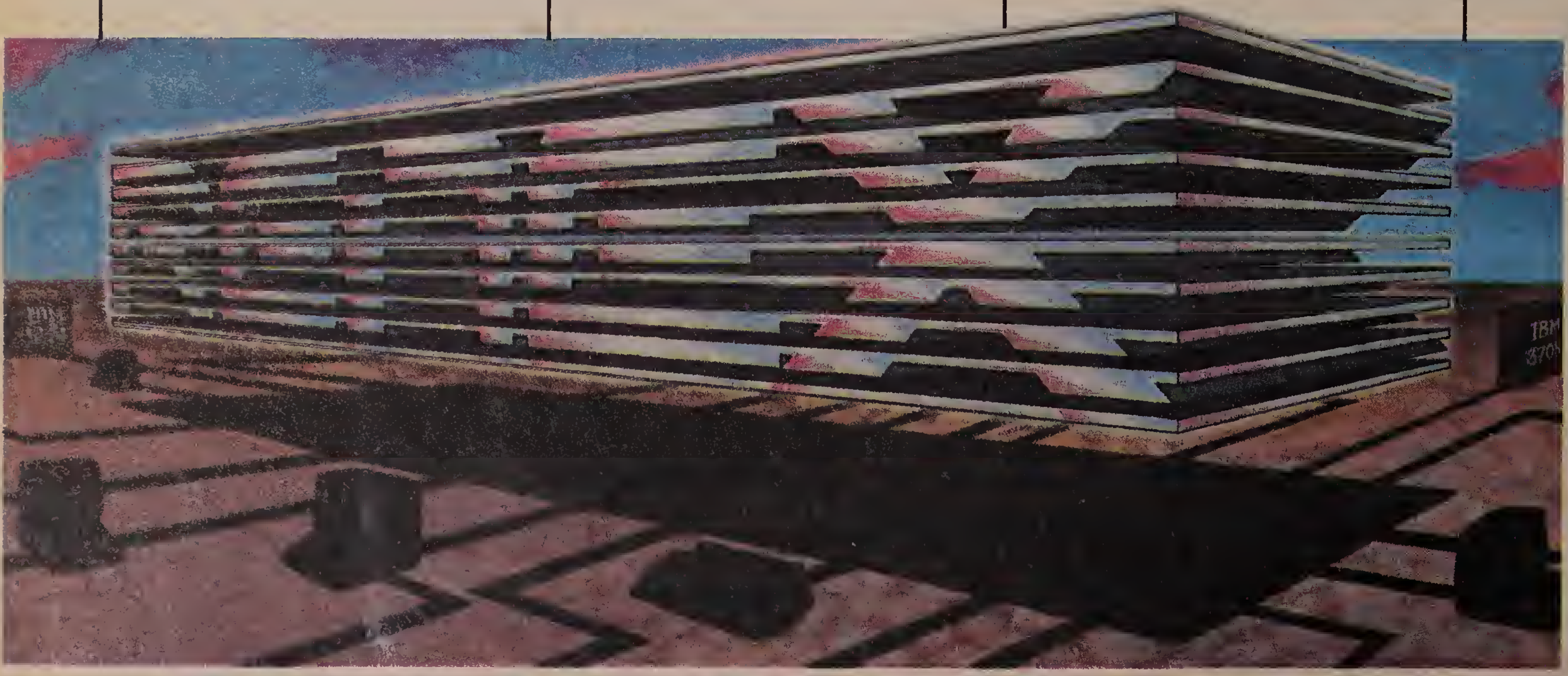

OPENING NEW LINES OF COMMUNICATIONS

COMMUNICATIONS MANAGER

> “More than $7 billion was spent in 1985 on U.S. private telecommunications networks. It is estimated that more than $40 billion will be spent in 1995.
>
> **based on the study,**
> **“Evolving Market Opportunities in Network Management”**
> International Research Development
> Norwalk, Conn.

EQUIPMENT MAINTENANCE

Service contracts are a wise way to go

Function, not price, should be the first priority.

BY MICHAEL FAHEY
Staff Writer

Users say a monthly service contract with equipment manufacturers and distributors can protect users from unexpected major repair bills and may lead to better service.

A maintenance and equipment contract is particularly important on big ticket items such as private branch exchanges.

In such cases, anticipated service costs are easier to work into a yearly communications budget.

“A problem with a large piece of equipment could have major ramifications if you have no service contract,” said Neil Carrell, network control manager at First Interstate Bancorp in Seattle.

Peter Farber, director of technical support and communications at Saga Corp. in Menlo Park, Calif., agreed that at the very least, a service contract allows users to spread repair costs over a longer period of time. “You are paying money out every month,” Farber said. “But you are not going to get hit with a big bill.”

Farber said his company has tried to eliminate service contracts on computer terminals. But the move did not save Saga money on repair and service charges, so the company has again turned to monthly contracts to meet its service needs.

Large users with in-house maintenance personnel can cut back on service contracts, according to John Smith, manager of corporate communications at Zenith Electronics Corp.

At Zenith’s Chicago headquarters, staffers perform much of the company’s maintenance and service tasks. However, at some locations, the staff lacks the expertise to take on some maintenance and service responsibilites. In those places, regular service contracts are necessary to guarantee prompt and reliable service.

Smith said it is better to allow the manufacturer to service and repair some complicated and vital pieces of equipment. “We’re generalists, not specialists,” Smith said. Smith has a service contract with Northern Telecom Ltd. to cover major sevice and repair problems for the PBX.

Ron Orazine, senior consultant at Network System Design Corp., a Waltham, Mass.-based consulting firm, said function, not price, should be the most important consideration when it comes to arranging service contracts. Users should also research a product’s track record for reliability to evaluate its service needs better, he said.

Users should fully understand the terms of any service agreement, according to Orazine. Key questions to ask are whether the user will be billed for the time that service personnel spend traveling to and from the job. Also important is whether the service crew regularly brings tools to begin working on a problem immediately. Orazine said a manufacturer or dealer’s reluctance to enter into a clearly defined agreement with reasonable response time is one tip-off that the equipment or service staff in question has a poor reliability track record.

GUIDELINES

MARGIE SEMILOF

Making techies talk

The success of any new communications project does not wholly depend on a communications manager’s technical ability. It also depends on the manager’s ability to communicate verbally with end users and senior management before, during and after the project’s implementation.

“People skills” are a must for communications managers. In the past, technical employees had little contact with end users. But those employees now have terminals and personal computers and are often required to share information with other departments.

The corporate technical team must be a source of knowledge and guidance for those end users.

John Ouellette, of Arnoudse & Ouellette Associates, Inc., a Manchester, N.H.-based management consulting firm, suggests that the technical team must be prepared to work harder these days. In light of their increasing contact with end users, he says technical staff members and managers should develop a mission statement and define the roles they will play within their companies.

Arnoudse & Ouellette points out that data processing projects may get into trouble for reasons other than the technical people doing a poor job designing network tools, or because end users fail to define their information requirements.

Problems, the firm maintains, arise when neither group pays sufficient attention to the process of building and maintaining a high-performance technical staff/end user project team.

The user and the technical staff member should work together to solve technology-related problems, Ouellette says. The team approach helps end users understand why the chosen solution is deemed best, and at the same time, they have some stake in the decision-making process.

“This gives the user some commitment to a problem’s solution,” he adds.

To improve the relationship between the technical staff and the end-user community, Ouellette suggests placing technical staff members in different departments for a day to work with those groups and learn their function.

“This helps build trust,” he says. “Also, if people have a clearer idea of your function, they will be able to go to you for information.”

In addition, Ouellette suggests that managers who are building their information center staffs should choose individuals equipped with social skills and those who demonstrate the ability to listen.

PEOPLE

Linda Gargiulo was named communications manager for the Grand Union Co. She is responsible for planning and implementation of voice and data communications for all company locations. Gargiulo was most recently communications specialist for CIT Financial Corp.

Robert Peiser has been appointed vice-president and chief financial officer for ALC Communications Corp. and its subsidiary, Allnet Communications Services, Inc.

Peiser was most recently senior vice-president of finance and chief financial officer at Trans World Airlines.

Robert Sternberg has been named chief operating officer at TRT Telecommunications Corp. Sternberg was most recently president of Sidereal Corp. Also at TRT, **Richard Kozak** was appointed executive vice-president and chief financial officer.

Argo Communications Corp.’s **Jose Zevallos** has been named director of information systems. Zevallos was most recently Argo’s manager of information systems.

Malcolm Welch was appointed vice-president of DASA Corp. Welch was most recently vice-president of advanced planning and technology at Bunker Ramo Corp.

Robert Everett was elected to the Board of Directors of Digital Equipment Corp. Everett recently retired as president and chief executive officer of the Mitre Corp.

Tandem Computers, Inc.’s board of directors has elected **Walter Wriston**. Wriston retired in 1984 from Citicorp., where he was chairman and chief executive officer.

Pierre Suard was appointed chairman of Compagnie Generale d’Electricite in Paris. Suard was most recently vice-chairman and managing director of Alcatel.

Wanted:

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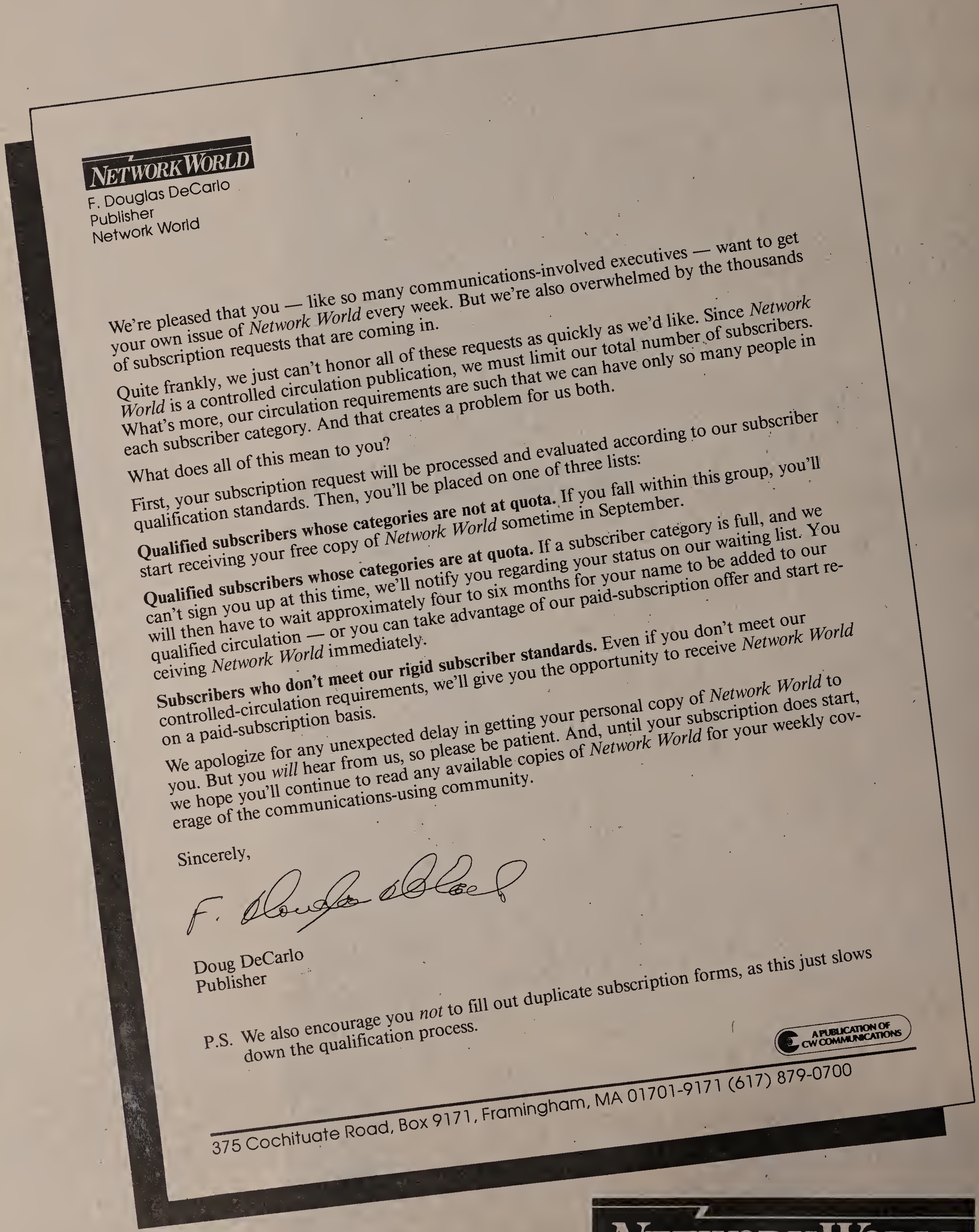

NETWORK WORLD

F. Douglas DeCarlo
Publisher
Network World

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NETWORK WORLD

NEW PRODUCTS AND SERVICES

Coming next week:
▶Wang VS to link with Macintosh
▶TI Explorer artificial intelligence system tied to IBM and DEC
▶MVS connection to TCP/IP

▶ RACAL-MILGO

Firm adds to modem line

Unit offers speeds up to 14.4K bit/sec.

BY JIM BROWN
New Products Editor

SUNRISE, Fla. — Racal-Milgo, Inc. recently added a Trellis-coded Modulation modem to its Omnimode line.

The firm introduced a CCITT V.33-compatible synchronous modem operating in full- or half-duplex at speeds up to 14.4K bit/sec.

The Omnimode V33's front panel displays selected modem speed, port configurations, transmit level and diagnostic information. A central site unit equipped with a Remote Modem Control option can be used to monitor, configure and test all units in a modem network.

The device also includes several testing and diagnostic features that can be programmed from the front panel. Local, remote and end-to-end tests include error detection tests, poll tests, test-tone generation and loop-back tests meeting the CCITT V.54 standard as well as analog and digital loop-back tests.

The unit's eye pattern generator will also visually display telephone line characteristics on the front panel.

An optional Line Quality Analysis feature operating on Omnimode V33 modems connected to Racal-Milgo's CMS network management system performs telephone line tests that reportedly conform to published requirements.

The Omnimode V33's modem sharing option supports multiple access to a single phone line for up to four attached devices for either fan-in or fan-out operations.

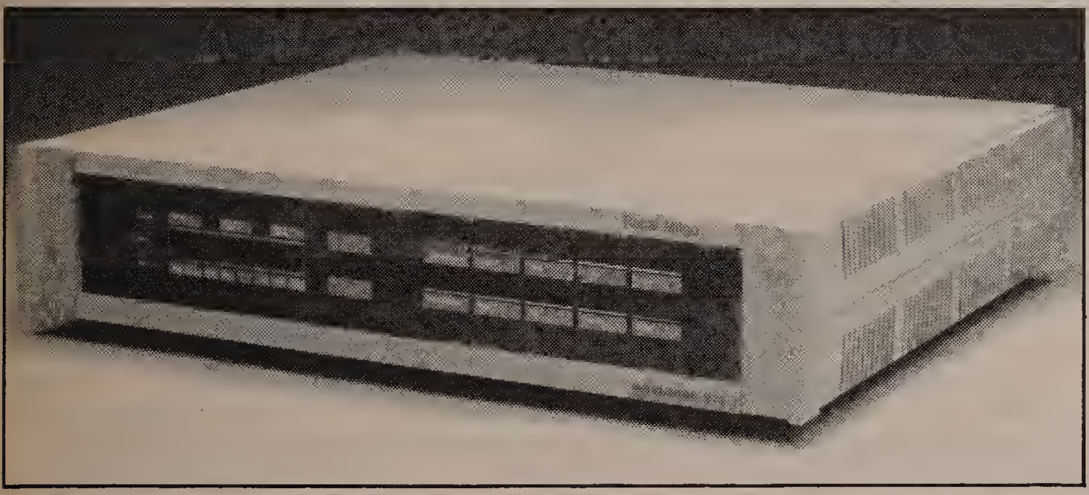
The unit also includes diagnostic and management control functions that can be programmed from a touch sensitive front panel.

Racal-Milgo is offering what it calls a V.33-compatible Multiport (MP6) option for the Omnimode V33. The integral MP6 feature turns the Omnimode V33 into a six-port, time-division multiplexer that supports varying speeds for each port.

Selectable speeds supported by the MP6 option include 2,400 bit/sec, 4.8K bit/sec, 9.6K bit/sec, 12K bit/sec and 14.4K bit/sec.

The MP6 option also supports multidrop tail circuits through its control signal simulation that lets each port operate in a switched carrier mode.

Available in October, the basic Omnimode V33 unit will cost $5,925. The Remote Modem Control option is priced at $1,000. The Line Quality Analysis option costs $300. The modem sharing option is $350 and the MP6 option is $1,200.



▶ DATA TRANSMISSION

Fiber-optic modem out

2.2-mile capacity.

BY JIM BROWN
New Products Editor

RICHARDSON, Texas — Honeywell, Inc.'s Optoelectronics Division introduced a fiber-optic modem designed to operate over distances of up to 2.2 miles.

The HFM5210 modem operates in full-duplex mode and transmits asynchronously at speeds of up to 19.2K bit/sec.

It is a sequel to the company's HFM5200.

The HFM5210 can be used only for data and supports three wires, a Honeywell spokesman said. The unit is plug- compatible with most four- and nine-wire serial RS-232 devices and is powered through an RS-232, 25-pin connector.

The HFM5210 is designed to link asynchronous terminals or personal computers to either distributed communications controllers or host computer systems.

The device has an RS-232 connector on the data side.

On the transmission side, Honeywell provides one of two connectors. One is an AMP Products Corp. active device-mount/single-fiber resilient ferrule connector. The other is an SMA905/906 fiber-cable connector.

Electronic data signals enter the device and are converted to light sources.

A light-emitting diode transmits the data over the fiber-optic cable to the terminating modem, which reconverts the light signal to electronic signals.

The modem has no self-test or diagnostic features.

The company is working on fiber-optic modems that will support RS-449 and RS-422 devices and is also planning a fiber-optic modem operating with T-1, voice-grade quality and speed.

The HFM5210 lists for $96.10.

PRODUCTS & SERVICES

Micro-to-mainframe package

Barr Systems, Inc. introduced a micro-to-mainframe communications package supporting file transfer between IBM Personal Computers and Control Data Corp., Cray Research, Inc. and IBM hosts supporting the Houston Automatic Spooling Program multileaving protocol.

The **Barr/Hasp 86** consists of a half-size personal computer expansion board and Binary Synchronous Communications software. The expansion board includes an autodial modem that operates at speeds of 19.2K bit/sec on an IBM Personal Computer and 56K bit/sec on an IBM Personal Computer AT. It provides protocol conversions and reportedly can be used in local-area network environments. The package reportedly supports filing printouts and plot files received from the host to a local disk while files are concurrently being sent from the personal computer to the host.

The package lists for $890.

Barr Systems, Inc., 2830 Northwest 41st St., Building M, Gainesville, Fla. 32606 (800) 227-7797.

Relay upgrades

VM Personal Computing, Inc. released upgrades of its **Relay Gold** communications package and its **Relay/VM** and **Relay/TSO** file transfer packages.

The firm also unveiled a personal computer-to-personal computer communications package called **Relay Silver**.

Relay Gold Release 2.0 supports Digital Communications Associates, Inc.'s Irma 3278 and 3279, IBM's 3278 and 3279 and Forte Communications, Inc.'s PJ terminal emulation expansion boards for personal computers from IBM, Data General Corp., Wang Laboratories, Inc. and Hewlett-Packard Co.

Relay/VM Release 2.2 and Relay/TSO Release 2.2 run on IBM mainframes and support the enhancements made to Relay Gold. Both packages transfer files from the mainframe to Relay Gold-equipped personal computers connected to an emulation board or protocol converter.

Relay/VM runs under the VM/SP operating system; Relay/TSO runs under the VMS/TSO operating system.

The Relay Silver package reportedly yields Relay Gold-type functions for communications between personal computers. The package supports the Xmodem, Kermit and Relay communications protocols and modems made by AT&T Information Systems, Hayes Microcomputer Products, Inc., Racal-Vadic, Inc. and others.

Relay Gold Release 2.0 lists for $250. Users who purchased Relay Gold Release 1.0 after June 9 can upgrade without charge; those who purchased it before June 9 can upgrade for $40.

Relay/VM Release 2.2 lists for $5,000. Relay/TSO Release 2.2 lists for $7,500. Relay Silver will cost $150 and will be available in September.

VM Personal Computing, Inc., 41 Kenosia Ave., Danbury, Conn. 06810.

SPEECH SYNTHESIS

JEFFREY ROTHFEDER

$$$ speak louder than words

"The speech synthesis market is not large in sales — only about $10 million to $15 million per year right now. But there is a bright side: We easily see sales doubling annually through the remainder of the decade." So says William Spain, research associate for Probe Research, Inc. in Morristown, N.J., a firm that has just completed the most extensive study to date of the voice technology marketplace. Unfortunately, Spain's forecast has a familiar ring to it, one that has echoed many times during the past few years.

Speech synthesis is a process in which a computer chooses requested data from a pool of information, converts it into text and then recites it verbatim to a user on the other end of a telephone line or a speaker. Speech synthesis has been a laggard communications technology on the verge of heady and unstoppable success for so long that it's grown old while still trying to become the new kid on the high-tech block.

The following are just a few of the applications that proponents for speech synthesis continue to claim are just around the corner:

- New structure for electronic mail in which the speech synthesizer reads internal mail to employees calling in from the road or corporate outposts.
- Inventory status and control that allows the computer, responding to requests, to provide a verbal report of incoming and outgoing stock.
- Order entry and banking by telephone that uses a synthesized voice to prompt a person to input commands through a push-button phone. It then reads back a record of transactions at the end of the session. But analysts such as Spain and William Creitz, editor and publisher of *Voicenews*, the leading insider newsletter covering voice recognition, voice synthesis and voice mail, disagree.

According to Spain and Creitz, speech synthesis may indeed be ready to emerge as a more common and essential ingredient in many corporate communications systems. On close inspection, there is some reason to believe that this time they may be right.

For example, some major companies that have grown wealthy by accurately riding the crest of technology breakthroughs are turning their attention to speech synthesis and incorporating it in new products. The following are some of those firms and their products:

- AT&T's messaging peripheral, Speak To Me, attaches to AT&T's digital private branch exchange Systems 75 and 85 and relies on speech synthesis with its ambitious order-entry and data retrieval system, Conversant I.
- Texas Instruments, Inc. has incorporated computer speech in its TI-Speech voice technology product and is marketing it as a low-cost, high-return E-mail, dispatch and order-entry system.
- Digital Equipment Corp., which pioneered speech synthesis with its product known as Dectalk, says that a recent upturn in sales for its speech synthesizer is the prime reason that it has increased its voice technology line to include a new Dectalk board for system integrators and an eight-line Dectalk unit.
- IBM, in an effort to goad developers into making the Personal Computer and other IBM computers the standard for all types of voice technology efforts, has released a speech synthesizer, Augmented Phone Services (Aug) for the hearing and speech impaired. Aug verbally relays to callers the words a user types into his computer.

The entrance of these firms into the slow-moving speech synthesis marketplace has spurred a sudden increase in its acceptance among larger communications technology users. For example, Citicorp in New York, the Pacific Presbyterian Medical Center in San Francisco and Cummins Engine Co., Inc. in Evansville, Ind., one of the nation's leading designers of diesel parts, have all recently installed speech synthesis and voice technology systems for E-mail and data base information retrieval.

Still, despite these gains, vendors of voice mail — the main competitor to speech synthesis in electronic messaging — are resisting the integration of speech synthesis into their systems. Sales of voice mail units, which store actual audible messages for later retrieval by transmission recepients, are thriving.

According to a survey conducted by the Marketing Programs and Services Group in Gaithersburg, Md., voice mail sales were up to $200 million in 1985 and are expected to grow to $550 million by 1990. Because voice mail is doing so well right now, most voice mail manufacturers, including Rolm Corp. in New York and VMX, Inc. in Dallas, say that they'll wait for speech synthesis to become a vital

See **Speech** page 28

Rothfeder is a free-lance writer based in Wyckoff, N.J.

ON-LINE SERVICES

MARK WINTHER

Whither videotex?

Since the 1970s, videotex has been heralded as the medium that will allow millions to shop and bank electronically and call up computerized data bases inexpensively from their homes and offices.

Conceived along the lines of television and publishing, these systems were to be supported by advertisers that would find their color and graphics capabilities economically attractive as a means of displaying logos and pictures of their products. The advantage to advertisers of videotex over the conventional mass media is its ability to deliver targeted audiences. The major participants are newspaper publishers, who view videotex as an electronic extension of their paper-based products.

However, consumers proved unwilling to spend $600 and more for the special terminals needed to display the colorful graphics. In the meantime, personal computers began to proliferate in the home, and the most successful videotex service providers turned out to be Ascii text-only offerings, which are simply on-line data base services. Today, the biggest single videotex system operation in the U.S. is CompuServe, Inc., the Columbus, Ohio-based subsidiary of H&R Block, Inc., with some 280,000 users.

In its early years, videotex was viewed as a color graphics service. However, it is increasingly seen as being able to provide on-line services in Ascii text format to consumers. This shift has made the battle that raged around the color graphics systems moot. In addition to Ascii, there are several other videotex standards environments, most of them aligned with a particular country. They include North American Presentation Level Protocol Syntax, which has failed to succeed in the U.S.; Prestel in the UK; Bildschirmtext in West Germany; Teletel in France; and Captain in Japan.

In the U.S., the final nails were driven in the coffin of classic color-and-graphics consumer videotex with the recent demise of Knight-Ridder Software Co.'s Viewtron in Miami, Times-Mirror Videotex Services, Inc.'s Gateway in Southern California and Keycom in Chicago, owned by Centel Corp.

At the end of 1985, there were 488,000 consumer videotex subscribers generating a total revenue of $75 million; Link Resources Corp. forecasts that this will rise to 1.9 million subscribers generating $169 million by 1990. As these figures indicate, there will not be a breakthrough into a mass market for consumer videotex.

This prediction is based on two primary assumptions: the downturn in sales of personal computers into the home, and the growing evidence that systems operators will have a much harder time than was anticipated in breaking into the market for the noncomputer hobbyist household. Also, home banking services are no longer seen as the means of attracting personal computer owners who otherwise would not be predisposed to subscribing to videotex.

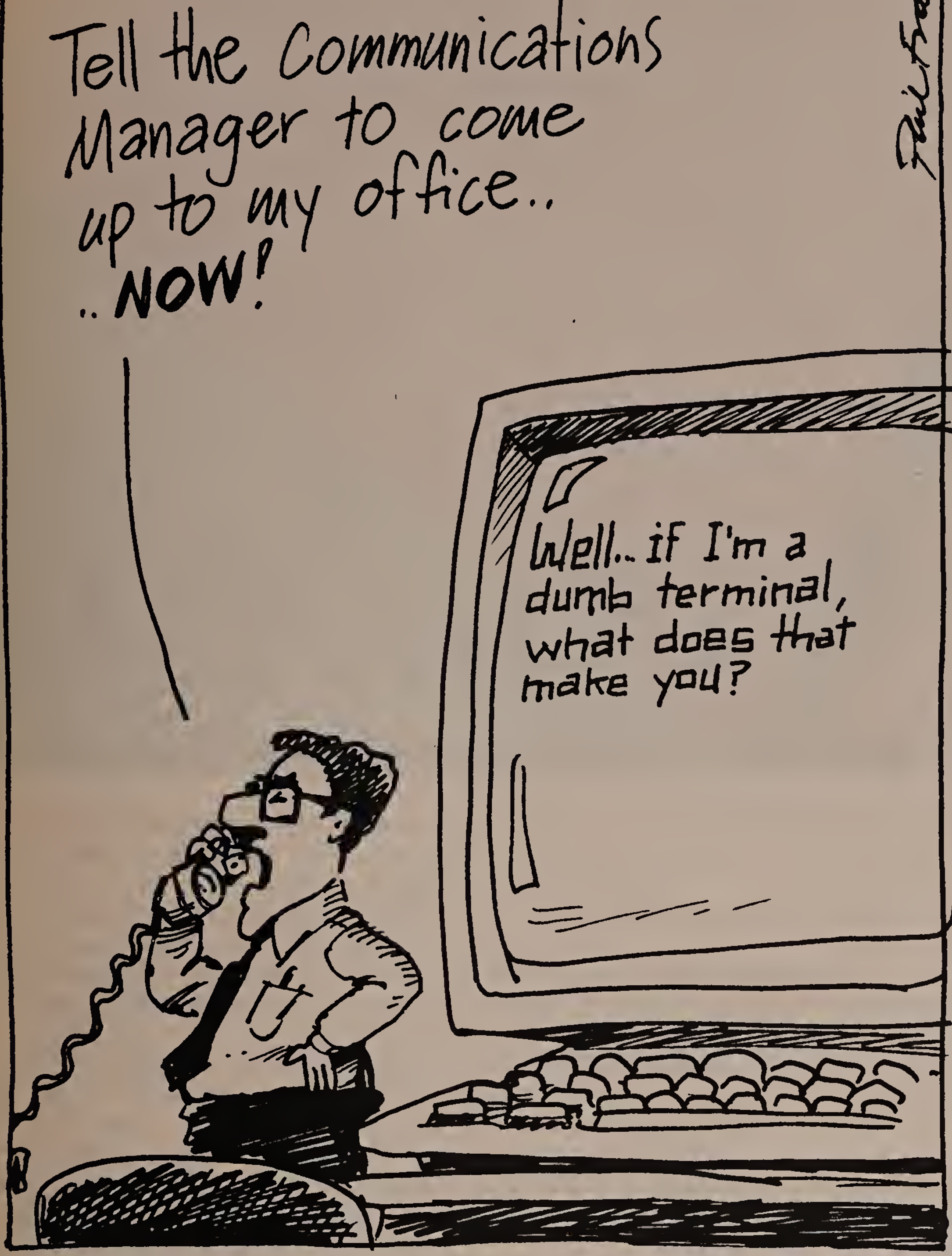
Promising markets

A still promising niche in the consumer market are the 2,000-plus grass-roots bulletin boards. These minivideotex services run on microcomputers and average about 300 calls per month. Assuming an average of 100 users per bulletin board — some systems have 500 separate callers per year — the "underground" videotex population in the U.S. hovers around 200,000 subscribers.

While the consumer market has been the recipient of most of the videotex attention, there are two other markets for videotex systems: corporate videotex and public access systems.

Winther is director of new communications services at Link Resources Corp. in New York.

▶TELETOONS — By Phil Frank


Tell the Communications Manager to come up to my office.. ..NOW!
Well.. if I'm a dumb terminal, what does that make you?

Corporate videotex is used by corporations or institutions for internal use or for interactions with customers or suppliers. Corporate videotex vendors in the U.S. came from the computer industry — Digital Equipment Corp., IBM, Honeywell, Inc., Sperry Corp. and others. Typically, their products are integrated videotex systems in which videotex software is sold to customers who already have CPUs and terminals and wish to use their existing hardware for videotex applications.

Although it is argued that corporate videotex offers distinct characteristics — namely ease of use and data base dynamism — it is likely that videotex will disappear as a distinct corporate information exchange system. It will probably be swallowed by MIS, data processing and office automation. Indeed, DEC is positioning corporate videotex beyond generic electronic bookshelf applications toward those that specifically address departmental needs in the office, on the shop floor, in sales and marketing departments and in corporate communications.

Videotex has suffered due to the unfortunate tendency for it to be pigeonholed as a narrow, graphics-oriented, stand-alone technology with little direct relationship to the world around it. What is important is that applications plus technology drive usage. Users must assess their application and then match it with the proper technology.

The U.S. Treasury Department, for example, bought DEC's VAX VTX videotex software for a sophisticated executive information system. While it is a relatively efficient consumer of VAX resources, the VAX VTX system was never implemented because customized interfaces had to be written for each gateway. Instead, the Treasury Department implemented its executive information system on the customizable user-friendly interfaces offered by DEC's All-In-1 office automation software. This allowed them to create a flexible, menu-driven, page-oriented data base for end users.

Public access videotex, which first generated interest in 1983 and 1984, is a growing market. Until re

See **Videotex** page 28

OFFICE AUTOMATION

MICHAEL DURR

OA conquers a key phobia

Office automation (OA) is a concept that eludes precise definition. Users know it's good. They just don't know exactly what it is.

Several software developers have built products around their unique visions of OA, which can be defined as a scheme that allows computers and related systems to handle jobs that would otherwise be done manually. A word processor is one example of an OA product.

If users are able to create documents with their word processors and send them directly to somebody else's personal computer via a network, they then automated yet another job. This bit of OA can be called "document delivery."

Users might be able to take the same document and route it to many people. Those people could then return comments electronically from their personal computers. These functions are basic electronic mail capabilities. The goal of each one of these OA functions is increased productivity. The ideal is to automate as many jobs as possible for optimum productivity.

But automating lots of individual jobs often creates its own set of problems. Users work in one application environment with its own set of rules and syntax. To perform a different job, they then exit and enter another environment, and so on. They are wasting time exiting one application and loading another, trying to remember each application's commands and, perhaps worst, trying to move information from one environment to a new and often incompatible environment.

As these problems became well-known, most users stopped referring to individual applications as OA. The term began to be applied to packages that integrate individual applications.

Some integrated packages contain several applications, including a word processor, spreadsheet and data base manager. These packages can be loaded on a hard disk, except for the key-disk, and can share the application and data files.

From an OA viewpoint, the best product in this category is probably Innovative Software, Inc.'s Smart. Smart not only has hard-disk loading and file-sharing capabilities, it can also support a multiuser environment. The package follows the DOS network primitives, providing support for standard file locking. Smart's data base manager supports record locking, enabling many people to use a Smart data base management system application simultaneously. And Smart doesn't use a key disk; the whole package resides on the hard disk.

Another OA alternative is Desqview, a software integrator from Quarterdeck Office Systems, Inc. An integrator permits users to load two or more individual software applications simultaneously. It allows easy movement between applications and lets users import and export data from one application to another. Desqview also runs on DOS-compatible networks.

The newest group of OA software is the office organization tool. Users can use these tools as their principal automation software or in conjunction with the integrated packages and an integrator. Office organization software includes an E-mail program and usually one or more related programs.

If wide-area networking is part of the business, The Coordinator from Action Technologies, Inc. is a good choice as an organizational communications product. The Coordinator is fundamentally an E-mail package, allowing users to send messages and documents to other personal computer users.

A mailbox is set up at a host site. People then check the host periodically to see if they have any mail. The host can be accessed via a local-area network or through a modem and telephone line from a remote location. For example, a company might have a local net with two mailboxes. To send a message to someone in the office, a user would use the local mailbox. A message to someone at the remote site would be sent to the other mailbox.

The Coordinator lets users communicate with other systems by linking to MCI Communications Corp.'s MCI Mail. Users can send and receive messages with

See **Automation** page 32

Durr is public relations manager for Novell, Inc. in Orem, Utah.

NETWORK WORLD

Features

August 25, 1986

Anatomy of a cutover
Neither flood, fire nor work stoppage forced the University of Colorado's new telecommunications system off schedule. Hard bargaining and aggressive project management netted CU a timely cutover against high odds.
This page.

Stay tuned: Corporate broadcast receives high ratings
At A.L. Williams insurance company, employees are encouraged to watch television during the day. This maverick firm uses its nationwide video conferencing network to broadcast motivation and information to its 145,000 workers. Despite the controversy surrounding this unique business application, A.L. Williams says the network is gaining popularity among its agents.
Page one.

Modems charge into the fast lane
As personal computers evolve, an explosion of desktop processing power is creating a demand for more reliable, higher speed communications with a variety of equipment and services. In the near future, standard transmission speeds for personal computer communications may sprint to 18K bit/sec and beyond.
Page 29.

▶ PROJECT MANAGEMENT

Anatomy

BY STEVE MOORE
Features Editor

First of a two-part series.

If it's mid-afternoon on Friday, it's FAC time in Boulder, Colo. That's when the social animals among the University of Colorado's (CU) 20,000 students skip classes and dial up friends to arrange rendevous for the Friday Afternoon Club, a long-standing CU tradition of frenetic barhopping and partying.

Students' preFAC calls used to raise a deafening cacaphony in the basement that housed the university's telephone switching system, as thousands of electromechanical relays on the old 701 Centrex system clattered away.

Today, silence reigns in CU's switchroom — even on Friday afternoons. On July 31, Mountain Bell cut over the university's telephone trunks from the antiquated Centrex to a spanking new AT&T System 85 digital private branch exchange. The new system, which also incorporates AT&T's Information System Network, serves 10,000 telephone users and 500 computer users in roughly 200 campus buildings.

During a job tantamount to wiring a small town in one year, 65 miles of fiber-optic cable and enough copper wire to circle the earth 2½ times were used to rewire all campus offices, classrooms and dormitory rooms. Nearly every room is now equipped with dual-plug wall jacks for voice and data connections.

The managers who ramrodded the mammoth project agree that the cutover set the capstone on the most intense period of their careers.

"You shouldn't be expected to do many of these. You lose years off your lifetime," says Jeff Lipton, the director of office support systems at CU.

Lipton and his staff began the meetings that initiated the project more than four years ago. Actual construction began in June 1985. Since then, those involved with the installation have endured a change of wiring contractors, a fire, a flood and a strike — yet somehow, the system still cut over right on schedule.

Timely completion of the job was facilitated by farsighted and cooperative university administrators who helped Lipton slash through the red tape he says has derailed similar projects at other campuses.

"We consciously set this up almost as a skunk-works operation," Lipton explains. "We buffered it from the rest of the bureaucracy. If I had to run everything through purchasing or accounting or whatever, we'd be having this conversation three years from now, and I still might not have a cutover."

Countdown to cutover

Picture the commotion barely an hour before the cutover, as a crew

# of a cutover

of six AT&T operators prepares to handle users' trouble calls at a control center in the basement of the university's new telecommunications facilities building.

The building is still under construction. Dozens of managers and executives in ties and wing tips mill around amid a platoon of electricians, pipe fitters and other busy, tool-laden tradesmen.

Disasters both natural and unnatural complicate completion of the university's gargantuan telecommunications system.

Lipton's companions on cutover day are Dave Heinz and Pat Pomponio, AT&T's branch manager and project manager. Also on hand are Art Helfrich and Jack Bindley, regional manager and senior consultant for Telecommunications International, Inc. (TII), the Denver consulting firm retained by CU. All appear surprisingly relaxed. "Everybody knows what to do, and AT&T is all pumped up," Lipton says. "All I can do now is sit back, keep the bureaucracy out of the way and let them do their thing."

The cutover is deliberately scheduled at 5 p.m. on a Thursday so AT&T will have Friday to collect users' complaints and then an entire weekend to handle them while the campus is sparsely populated.

"CU's staff has taken such an active role, they've made this cut," Helfrich observes. "If a university takes a passive role, they're asking for trouble."

"As we come down the home stretch to the cut," Heinz adds, "the thing that both AT&T and CU have been most concerned about is the data base collection, which has turned out to be a little bit underestimated in terms of how much time and resources it would take."

Difficult data base

AT&T's data base contains cable and equipment records for every room in every building. Careful data base collection is considered by all managers involved to be a critical success factor for large telecommunications systems.

"We started collecting our data base 12 months ago," Heinz points out, "but we should have started two or three months earlier.

That means we would probably have been better off to get started almost immediately upon signing the contract.

In the old [predivestiture] world," Pomponio adds, "everything used to be on manual records, and when you had a change, you went in with a pencil and eraser.

"Today, if you don't have a mechanized cable administrative plan, you're going to be in deep trouble. There's just too much information out there that you need to have a handle on, and you have to be able to bring it up on a screen easily, rather than shuffling through reams and reams of handwritten records."

For the CU cutover, AT&T customized its data base to enable user trouble reports to be generated on a terminal, printed out and then used to dispatch technicians to make whatever repairs are necessary.

Changes are noted on the hard copy, which is then returned so the data base can be updated. "From the customer side," Lipton says, "you need a data base to do billing. You've got to know what equipment, what lines and what departments to map against the general ledger account structure." CU's data base is integral to its Sys-

☞ Continued on **page 28**

From **page 27**

tem 85 management system, which is run on a Prime Computer, Inc. minicomputer that is linked to computers at the university bursar's office. Because none of the vendors that bid on the job, including AT&T, had management systems to Lipton's liking, Lipton went through a separate selection process before settling on the Prime-based system.

"The key is collecting from the students," Lipton says. "We're integrating our billing and collection process with the one already used for the students." Students who don't pay their phone bills risk having grades and transcripts held up, or even being disenrolled, just as they do if they fail to pay tuition or library fines.

CU is an aggressive pioneer in the area of software-based telecommunications management systems. "It's a new field. I've yet to see a management system that comes close to doing what I'd want it to do," TII's Bindley says. "Software developers haven't thought of integrating into a bursar's office or other business organizations with different departmental structures."

Bindley says the CU project has shown him that if a management system goes in with a switch, it must be operational 60 to 90 days after the contract is signed so that there is a year, typically, to tweak it before system cutover time.

The proof of the pudding for Lipton will be whether he can issue his first month's billing accurately and on time. "If we do pull it off," he says, "we believe it will be a first, at least in the university environment. We haven't heard of any other schools that have been able to do that."

Stumbling blocks abound

Accurate collection of the CU data base was complicated by other problems. First, AT&T's cabling contractor had to be kicked off the job because of shoddy workmanship and other problems, according to user and vendor managers associated with the project. As AT&T's Heinz ruefully advises, "Customers should be sure the vendor reassures them that the subcontractor involved is going to do the job the customer demands."

Lipton observes, "This project started off very shaky. We lost a lot of ground and had to redo the wiring in a lot of buildings, but I give AT&T credit. When we pressed them for some big changes, they made them. They brought in a competent project manager, Pat Pomponio, who brought a highly motivated staff with him."

TII's Helfrich agrees with Lipton that AT&T, which lost most of its in-house cabling capability during divestiture, is still learning which subcontractors can handle large jobs. At CU, he says, AT&T brought in the Denver division of Henkels & McCoy, Inc., which "really picked it up and did a good job."

Pomponio came on board at the same time as the new contractor — that is, just in time to deal with several new problems in addition to the rewiring job. "The day after the switch [worth $4 to $5 million] was delivered in the basement of the new building, we had three or four inches of rain here in just about an hour. The pumps in the basement failed, and we had water coming into the switch room." Luckily, a passing workman saw what was happening and was able to pop the switchroom floor tiles out and trap the water below the floor until it could be pumped out.

About a month after that, there was a fire in the room that housed the batteries for the emergency backup system. "A spark from a welder's torch on the third floor came down and ignited the battery room floor, and the flames came through the fire wall," Pomponio recounts. Luckily, the fire was extinguished before major damage occurred.

Then came the labor stoppage. "The AT&T strike went on for 26 days, and we had to bring in a lot of people from different walks of life. They were all AT&T management people, but they came in from all over," Pomponio says.

Because of the strike, Lipton revised his estimate of how successful the cutover will be. Originally, he expected that only about 2% of the 10,000 voice lines installed would generate "hard" trouble calls due to problems that actually interrupt users' telephone service, such as missing phone sets or lack of dial tone. Now, minutes before cutover, his estimate is 4% to 6%.

At 5 p.m., everyone hovers around the AT&T control room to see how many trouble calls come in. Nothing happens. The CU staff, suspicious, calls Mountain Bell. Sure enough, all calls are mistakenly being intercepted at the Mountain Bell central office, and nothing — not even 911 emergency calls — is going through. The gaffe is corrected immediately though, and at 5:10 p.m., the trouble center phones begin to ring.

Meanwhile, a celebration is in full swing. A lucky few receive Henkels & McCoy baseball caps that read, "We did it at UCB" (University of Colorado, Boulder). Pizza, beer and pretzels are devoured along with a "Happy Cutover" cake.

But as Lipton's plant operations manager, Jim Baker, says half-jokingly, "The icebergs are getting deeper. Ruptured bulkheads are just a few minutes away." He and the rest of the old hands know that the real cutover begins the morning after.

Next week, part two: From cutover to acceptance.

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marketplace before spending hefty research and development dollars on it.

There are two major problems holding back speech synthesis. First is cost; this becomes a factor especially when speech synthesis is compared with voice mail. The price of each voice output channel on a high-quality speech synthesis application can run from $3,000 to as much as $5,000, and that's exclusive of the purchase of host computers or PBXs. Stack this up against an output channel cost of $2,000 or less in voice mail, and the advantages of speech synthesis as a messaging system pale.

The second problem facing speech synthesis is voice quality. Despite a host of technical improvements that has made the computerized voice lose its staccato robotic accent, there is still a wide array of research questions to answer before the mechanical voice sounds human.

Even speech synthesis developers concede that it will be many more years before this voice is significantly improved.

"At first, speech synthesis will be far more successful for internal corporate applications," says Spain of Probe Research, "because in that scenario, you're dealing with a motivated user who has a reason for listening to the computerized voice and will not object to it. Computerized voice, though, simply does not present a comforting or welcoming image for a corporation to offer to the public at this point."

None of this is of great concern to speech synthesis developers, whose goal at this point is simply to get communications managers and other corporate decision makers to give the technology a second look.

"We feel we have some big advantages over voice mail," says Margaret Lindberg, director of advertising at Speech Plus, Inc. in Mountain View, Calif.

"For instance, [when] using voice mail for dispatching or electronic correspondence, there is no record trail of the messages or of the intracorporate requests. With speech synthesis, there is. You can print hard copies of your data base, from which the computer reads in a speech synthesis system." Speech Plus and DEC are the current leaders in speech synthesis technology.

When the dust settles from the arguments for and against speech synthesis as a communications tool, two lessons will stand out: If communications managers are planning future systems, the capability for speech synthesis — and that of all voice technologies — is a wise hedge against falling behind advances in communications research. However, if they are building systems to plug in today, speech synthesis may be too immature and costly.

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cently, the model for public access videotex systems in North America has been the multisite, advertiser-supported system. This system was originally conceived with the end user in mind, as a city or area guide for tourists.

The services typically provided information via terminals or kiosks on accommodations, attractions, events, entertainment, shop services, restaurants and weather.

Such systems are now operating in Toronto, San Francisco, Phoenix, Sacramento, Calif., Las Vegas, Nev., San Diego, Singapore and Tokyo. Initially geared to single-city markets, plans are underway for regional and statewide systems.

Newspapers flocked to these systems, including the Tribune Co., Inc. (Orlando, Fla. and Chicago), Courier Communications Corp. (Louisville, Ky.), McClatchy Newspapers (Sacramento, Calif.) and Chronicle Videotex, Inc. (San Francisco).

Information providers typically tell prospective customers about their products or services and then tell them how to get to the point of purchase, either by providing maps on the screens or by printing out text instructions. This classic public access videotex application has not had great success with advertisers. It continues to struggle to establish a niche in the hearts and minds of advertisers and their agencies.

Transactional videotex

Increasingly, the public access videotex application is migrating toward terminals that not only provide information and advertising, but also allow the individual to act — to transact. This transforms the kiosk into an electronic shopping service.

These kiosk systems stock brand name products. The user selects a product and enters shipping instructions. The kiosk has a magnetic card reader to accept credit card payment, as well as a receipt printer. Such kiosks appeal to the retailer because they increase his product selection without increasing floor space or the cost of selling, and they increase traffic in the store at the same time.

Other instances of transactional public access are in the airline industry. Public access ticketing devices can be found at the Eastern Air Lines shuttle, at New York Air and at the Continental Airlines terminal in Kennedy Airport in New York. American Airlines TransAAction Terminal, which allows passengers to book reservations, buy tickets and carry away boarding passes, will be available at nearly 100 sites by year end. Hertz International Ltd. and Avis, Inc. rely on a similar technology for rapid customer checkout. Traveler information systems are being installed in airports and bus stations, convention centers and roadside tourist information offices.

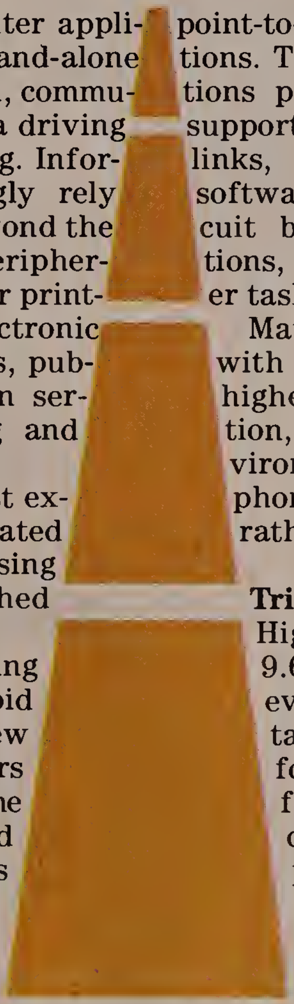
Hotel room services are being pioneered by Marriott, which is installing a Video Checkout system from Richardson, Texas-based Spectradyne, Inc. This in-room checkout service utilizes Spectradyne's proprietary box and keypad.

The terminal equipment is interfaced with the hotel's property management systems, the computer that manages hotel operations and tracks a guest's portfolio.

DIAL-UP SERVICES

Modems charge into the fast lane

BY MARY SCHALLER
Special to Network World



As personal computer applications shift from a stand-alone to a network orientation, communications is emerging as a driving force in desktop computing. Information workers increasingly rely on a variety of resources beyond the desktop, including shared peripherals such as file servers and laser printers on local-area networks, electronic mail networks, central data bases, public data networks and information services such as Compuserve, Dialog and Lexis.

Personal computers were once almost exclusively dependent on internally generated corporate data. Now they make increasing use of external information that is reached through dial-up networks.

Another important development affecting personal computer communications is the rapid progress of microprocessor technology. The new Intel Corp. 80386 chip gives desktop computers processing power rivaling that of older mainframe computers (see Figure 1 on page 32). Distributed across desktops, this power requires communications systems that tie these desktop mainframes together.

Such systems must provide more than traditional, point-to-point data communications. They require communications performance sufficient to support micro-to-mainframe links, high-resolution graphics, software development, printed circuit board design, video applications, network polling and many other tasks (see figure 2 on page 32).

Matching communications products with personal computers necessitates higher speeds and better error correction, as well as resilience to the hostile environment of the public switched telephone network, which is designed for voice rather than data.

Trio of transmission technologies

High-speed, dial-up modems, which operate at 9.6K bit/sec and faster, play a pivotal role in evolving desktop communications. They contain digital signal processing chips that can perform more than the traditional transmission functions. Many of today's high-speed modems incorporate error-correcting protocols as well as telephone line measurement and analysis functions. Some are able to determine the characteristics of the receiving modem and adjust to its speed.

Schaller is director of marketing at Telebit Corp.

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The Texas Instruments, Inc. TMS 320 digital signal processors are the most common chips used for high-speed modems.

Two high-speed modulation methods that use digital signal processing chips include the CCITT V.32 standard and Telebit Corp.'s multicarrier modulation. V.32 is the CCITT standard for full-duplex, two-wire dial-up communications at 9.6K bit/sec, while multicarrier modulation is a two-wire, dial-up modulation technique currently being considered by the Consultative Committee on International Telephony and Telegraphy for transmission speeds that are above 9.6K bit/sec.

A third alternative for high-speed communications is to couple a V.27ter or V.29 Rockwell International Corp. digital signal processing chip set with an error-control protocol and a data compression technique to achieve speeds higher than the current 2.4K bit/sec offerings.

The CCITT V.32 standard supports transmissions at 9.6K bit/sec, with a 4.8K bit/sec fallback rate. Primary applications for V.32 are synchronous and include providing dial-up backup for leased lines and replacing leased lines with 9.6K bit/sec dial-up modems. To date, only a few vendors have introduced V.32 modems, due to the complexity and high cost of implementing echo cancellation, a technique that allows full use of the bandwidth in both directions simultaneously.

> *“At about $3,500 each, V.32 modems are too costly for most personal computer or facsimile jobs.”*

At about $3,500 each, V.32 modems are too costly for most personal computer or facsimile applications (“Early users experiment with V.32 capabilities,” *Network World*, July 28). Moreover, the V.32 approach lacks many of the features required by the personal computer marketplace, such as a modem card version, use of the Hayes Microcomputer Products, Inc. command set, autodial and autoanswer facilities.

The CCITT is currently looking for a new high-speed dial-up standard that can be implemented less expensively than V.32 and that can operate at 9.6K bit/sec and faster on the public switched network, with specific performance requirements over Adaptive Differential Pulse Code Modulation (ADPCM)-compressed voice circuits.

Unlike V.32, which allocates a fixed amount of bandwidth for transmissions in each direction, the new standard will dynamically allocate bandwith as it alternates between sending and receiving tasks. Full duplex is not considered necessary. The study work could be completed as early as 1988.

> *“Instead of restricting data transmission to one or two carriers in the middle of the bandwidth, Telebit employs a Motorola, Inc. 68000 CPU to generate line analysis and uses advanced digital signal processing.”*

The second approach, which is designed specifically for optimized high-speed communications over dial-up lines, is Telebit's multicarrier modulation scheme. Instead of restricting data transmission to one or two carriers in the middle of the bandwidth as conventional modems do, Telebit employs a Motorola, Inc. 68000 CPU to generate line analysis and uses advanced digital signal processing to select as many as 512 carriers, or frequencies, across the full bandwidth.

This allows the modem to operate at speeds up to 18K bit/sec over dial-up lines and to adapt to changing line conditions by adjusting its speed to maintain error-free transmission. A current implementation

Finally, a data concentrator so unique you'll want to keep the box it comes in.
MB2-ESM
ENHANCED STATISTICAL MULTIPLEXOR

of multicarrier modulation is incorporated in Telebit's Trailblazer personal computer modems, which carry a list price of $1,995.

The third common approach to high-speed, dial-up communications is to buy a standard modem chip set from Rockwell (V.27ter or V.29) and add an asynchronous-to-synchronous converter and an error-correcting protocol to provide an asynchronous high-speed modem to the workstation market. V.27ter is a 4.8K bit/sec, half-duplex public switched network standard and V.29 is a 9.6K bit/sec four-wire, leased-line synchronous standard. Some vendors have also incorporated data compression schemes to go beyond the 9.6K bit/sec limit inherent in V.29.

Many facsimile vendors have adapted V.29 for half-duplex dial-up use. However, V.29 was not designed for use over the public-switched network. The new ADPCM channels being installed by AT&T and other common carriers provide major operational problems for the V.29 modulation scheme. Studies have shown bit-error rates of 10^{-2} over an ADPCM link with V.29 modems. Modems traditionally achieve a bit-error rate of 10^{-6} over normal circuits.

> *“Technological advances continually leapfrog standards. The industry is constantly challenged to marry new technology with the standards-setting process in an environment that is far from static.”*

ADPCM channels are being installed in the U.S. as a method of doubling the capacity of present facilities. They are also expected to be a cost-effective medium for transmitting voice and data traffic over the TAT-8 transatlantic cable, which is to be installed in 1988.

Microcom, Inc., Racal-Vadic, Inc. and Data Race, Inc. have announced modems that take this third approach. Although the vendors all started with an implementation of a standard modulation scheme, the error-control protocol and compression techniques, coupled with the modulation techniques, have rendered each scheme incompatible with the others. These products range in price from $1,500 to $1,800.

Given the combination of growing communications needs at the desktop, new applications made possible by 80386 technology, the high-speed and error-free transmission required for these new applications and the fluctuations in quality found in the dial-up network, the proposed asymmetrical modem standard is essential.

Technological advances continually leapfrog present standards. The industry is constantly challenged to marry new technology with the standards-setting process in an environment that is far from static. Users drive this process by buying large numbers of products using new nonstandard approaches and establishing them as de facto standards. In the case of high-speed, dial-up personal computer communications, the formal standards process via the CCITT and the de facto process via market acceptance are occurring simultaneously.

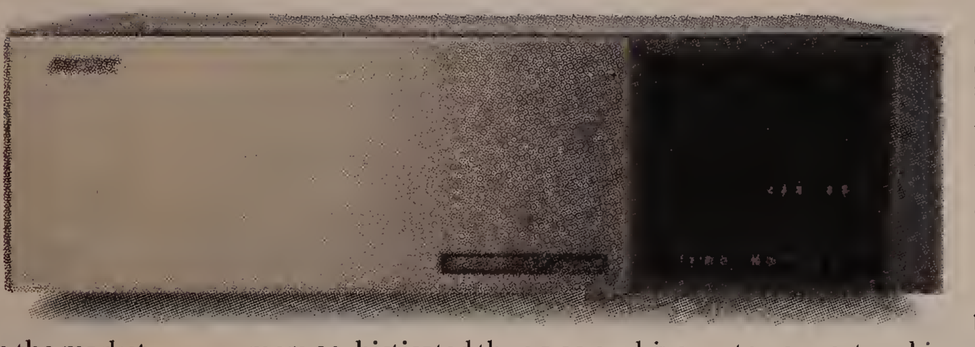
> *“Most vendors offer only rudimentary network management functions, such as monitoring the condition of a line.”*

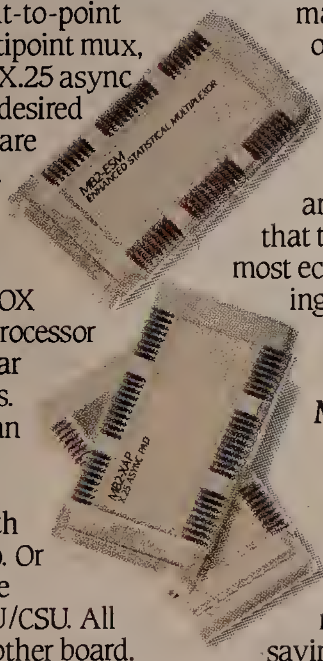
Nonstandard decisions

Until standards develop, users must make purchase decisions from a growing number of high-speed modems using a variety of technologies. In sifting through competitive claims, the following criteria should be considered:

- Is the modem compatible with the personal computer environment and with lower speed modems al-

Continued on page 32





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A quick look at the MICOM™ BOX will tell you this is no ordinary data concentrator. In fact, the MICOM BOX Type 2 is the most flexible to configure and easiest to install data concentrator on the market.

It couldn't be easier to respond to new applications or to tariff changes. With six FEATUREPAK cartridges to choose from you can make the MICOM BOX function as a point-to-point async stat mux, a multipoint mux, or even a multiplexing X.25 async PAD. Simply select the desired FEATUREPAK™ firmware cartridge and plug it in.

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Quite simply, the MICOM BOX provides the low cost, open-ended answer to accommodating new applications and emerging networking standards. So there's never a risk of obsolescence.

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Data concentration is fundamental to your networking success. But now the rules are changing.

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Calendar

Aug. 25-27, Chicago — Telecommunications Systems: Technology and Planning. Contact: Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Aug. 25-27, Austin, Texas — Internetworking and Advanced Protocols. Also, Sept. 10-12, Los Angeles. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

Aug. 25-27, Dallas — Hands-On Troubleshooting Data Communications Systems & Networks. Also, Sept. 3-5, Cambridge, Mass. Contact: The American Institute, Carnegie Bldg., 55 Main St., Madison, N.J. 07940.

Aug. 25-27, Detroit — Data Communications. Also, Sept. 3-5, St. Louis, Mo. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

Aug. 25-29, Santa Cruz, Calif. —Fault Tolerant Computing. Contact: Institute in Computer Science, University of California Extension, Santa Cruz, Calif. 95064.

Aug. 26, Kansas City, Mo. — Local-Area Networks: A Comprehensive Overview for Managers. Also, Aug. 27, Minneapolis; Sept. 4, San Francisco; Sept. 9, Indianapolis; Sept. 10, Chicago. Contact: Ungermann-Bass, Inc., 2560 Mission College Blvd., Santa Clara, Calif. 95052.

Aug. 26-28, San Mateo, Calif. — Interconnect '86: The Second Annual West Coast CPE Show. Contact: United States Telecommunications Suppliers Association, 333 N. Michigan Ave., Suite 1618, Chicago, Ill. 60601.

Aug. 27-28, Washington, D.C. — Data Communications and Networking for the IBM PC XT/AT and Other Compatibles. Contact: Digital Consulting Associates, Inc., 8 St., Andover, Mass. 01810.

Aug. 28, Monterey, Calif. — NETBIOS-TCP/IP Interface Specification Forum. Contact: Lee LaBarre or Paul Brusil, The Mitre Corp., Burlington Road, Bedford, Mass. 01730.

Aug. 28, Dallas — The IBM PC Data Communications Survival Course. Contact: Data-Tech Institute, Lakeview Plaza, P.O. Box 2429, Clifton, N.J. 07015.

Sept. 2-4, Sydney, Australia — Comdex/Australia. Contact: The Interface Group, Inc., 300 First Ave., Needham, Mass. 02194.

Sept. 2-5, Chicago — Fourth Annual Office Automation Society International Conference. Contact: The Office Automation Society International, Suite B, 15269 Mimosa Trail, Dumfries, Va. 22026.

Sept. 2-6, Chicago — Integrated Office Information Systems: The Myths and the Realities. Contact: The Information Exchange, Oasi, 15269 Mimosa Trail, Dumfries, Va. 22026.

Sept. 3-4, Chicago — Optimizing Long-Distance Services. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

Sept. 3-5, Washington, D.C. — Introduction to Installing, Operating, and Troubleshoooting Data Communication Equipment. Contact: The George Washington University School of Engineering and Applied Science, Washington, D.C. 20052.

Sept. 4-6, Nassau, N.Y. — Long Island Computer & Business Equipment Showcase. Contact: The Interface Group, Inc., 300 First Ave., Needham, Mass. 02194.

Sept. 4-6, Kansas City, Mo. — The Second Computer & Business Equipment Showcase. Contact: The Interface Group, Inc., 300 First Ave., Needham, Mass. 02194.

Sept. 7-10, Nashville — Planning for Network Integration. Contact: Southeastern Telecommunications Association, P.O. Box 901, Richmond, Va. 23207.

Sept. 8-9, Washington, D.C. — Managing Systems Projects. Contact: New York University School of Continuing Education, Seminar Center, 575 Madison Ave., New York, N.Y. 10022.

Sept. 8-12, Tulsa, Okla. — CICS/VS Command Level Programming. Also, Sept. 8-12, Chicago. Contact: Computer Assistance, Inc., Education Services, Suite 108, 11498 Luna Road, Dallas, Texas. 75234.

Sept. 9, Arlington, Va. — Achieving Excellence: How to Implement the New "Excellence-Oriented" Management Style in Your Department or Company. Also, Sept. 10, Charlottesville, Va.; Sept. 11, Richmond, Va. Contact: CareerTrack Seminars, 1800 38th St., Boulder, Colo. 80301.

Sept. 9, Arlington, Va. — National Capital Datapoint User Group Meeting. Contact: Margaret Valavanis, OSP/WHS/DCOAR, The Pentagon, Room 1C730, Washington, D.C. 20301.

Sept. 9-11, Atlanta — Intelligent Buildings Conference and Exposition. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

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From **page 33**

has its own printing press, it was still taking four to eight weeks to get company information into the hands of employees.

Maverick that it is, A. L. Williams began in July 1985 to investigate a satellite television network as an alternative information delivery vehicle. The company took the bull by the horns in November when it signed a network contract.

By December, the broadcasting studio was built and the 4.5-meter Scientific Atlanta satellite uplink was installed. Deployment of the remote, receive-only 1.8-meter dish antenna was also under way by this time. A. L. Williams made its first broadcast on April 28, 1986.

The speed at which this business decision was made is a credit to A. L. Williams' management, and the network design and implementation were carried out just as quickly. The translation from concept to production was sped by Satellite Conference Network, a New York-based company that provides a range of consulting and contracting for this type of alternate mode information delivery system.

Satellite Conference Network acted as the general contractor for the job. King says the company pulled the required network components together better, faster and at less cost than A. L. Williams could have hoped to on its own. The company contracted for the Scientific Atlanta earth stations and arranged the lease of 500 hours of use per year on GTE Spacenet Corp.'s Gstar I Ku-band satellite.

The deal, however, is incestuous. Satellite Conference Network is affiliated with American Can Co.

A. L. Williams is the sole agent for an insurance company owned by American Can.

Today, the network is in full swing, and it broadcasts training, education, regulatory updates, promotional campaigns and details on incentive programs to A. L. Williams offices across the country. Shows are broadcast two hours per day, 40 hours per month.

Each week is kicked off with a managers' meeting on Monday, led by A. L. Williams himself. His talks are typically educational and motivational and propogate the corporate philosophy, King says.

The broadcasts from Tuesday through Thursday cover business fundamentals and usually use new material daily, although some shows are repeated. The Wednesday broadcast also carries a 60-minute or 90-minute program on sales techniques. This segment showcases particularly successful salespeople who share their techniques.

On Friday, the company broadcasts a 30-minute program called "Signal for Success," another show meant to help salespeople. Besides these scheduled events, the video conference system delivers pertinent news broadcasts about important regulatory changes, special announcements and a video bulletin board that includes a schedule of events.

King stresses the motivational use of the network as a tool to disseminate the company philosophy, which dredges up images of fundamentalist television shows spreading the Gospel.

Despite that connotation, the network has met with company-wide success. This is primarily because most of the company's employees are part-time. Employing people part time is a strategic decision meant to soften the insurance hard sell and ease open the living rooms of America. A. L. Williams does not advertise and prohibits cold calls. All selling is done on a referral basis, and no sales are permitted on the first visit.

This strategy worked, but the company became a victim of its own success. As the part-time sales force grew, the company's top brass found it harder to reach employees. They needed a method to create and nurture the growth of a corporate culture and the motivation critical to the sales profession.

King admits having some reservations about use of videoconferencing to satisfy the need for employee contact. 'We were afraid of the TV interface," King says, "but we try to keep the broadcasts loose and understated."

The effect works. "Field reps love it," she says. "The network has brought the company together as if it were in the same office."

Early fears of not having enough material to fill the air space have been replaced with concern about how to limit the amount of broadcast material, King says. Initially, the company thought it would only broadcast 10 hours per month, but it cast that aside when it found that it could easily fill 40 hours per month.

Employees are not required to watch the shows, but they are highly encouraged to tune in. To avoid time zone conflicts, the satellite network is programmed to wake up attendant videocassette recorders at each office.

King says the office has to do a certain amount of business to justify the cost of the network installation. Therefore, not all of the A. L. Williams offices are slated to be on-line, even though the office workers pick up at least part of the cost for the earth station.

That may change if future network applications pan out. The company is exploring the option of using the satellite network to support a data channel to each office. This channel, which could be realized at little additional cost, could be used to download personal computer software and to drive laser printers.

King says that installing laser printers at each office would enable the company to print policies at the office, instead of its current practice of printing them centrally and mailing them. It would also enable A. L. Williams to print reports remotely, cutting mailing costs as well.

Data support will be initially tested at 9.6K bit/sec, but is capable of supporting transmission at speeds up to 56K bit/sec. Data would be encoded just as the video signal is, using a method called the B-Multiplexed Analog Component.

Although possible with the A. L. Williams network, two-way transmission is planned only for a few locations. The network is intended primarily as a dissemination vehicle, and there is little need right now for traffic in the other direction. Similarly, voice support is not intended at this point.

Although the company would not divulge actual network costs or savings, King estimates the system pays for itself in terms of postage savings.

A. L. Williams' "boss-in-a-box" video network may not, on first blush, seem appropriate for other companies, but that hesitancy is what pioneering companies like this count on. While boardrooms stuffed with pinstripes are mulling over business strategies, a daring few are out there putting new technologies to work.

A. L. Williams has surely turned a few heads in the hallowed halls of the stately, big-business insurance industry.

TCP/IP from **page 1**

junction with the Department of Defense's Advanced Research Projects Agency (Darpa), developer of TCP/IP.

A key conference goal is to bring together original designers of the protocols and vendors grappling with the problem of dissimilar implementations of TCP/IP. "Nothing like this conference has happened before on this level with this kind of technical strength," said Steve Holmgren, president of Communication Machinery Corp. in Santa Barbara, Calif.

Defined by Darpa in the early 1970s for use by the Department of Defense, TCP/IP has been implemented on Arpanet as well as on a military network called Milnet. Arpanet, Milnet and a number of other government and defense-related networks have been linked in a combined nework referred to as the Defense Data Network. This network of networks is based on a broad architectural model referred to as the Internetwork.

TCP/IP has also been incorporated in the Berkeley Unix 4.2 and has gained popularity in scientific, engineering and academic environments.

"I think TCP/IP is headed strongly into the commercial world," Holmgren said.

The original TCP/IP specification was created by users who were dealing with a mixed bag of transmission media, including satellites, 56K bit/sec lines and Ethernet local-area networks, said Daniel Lynch, president of Advanced Computing Environments, a Cupertino, Calif., consulting firm. The Defense Department network was designed to have tens of thousands of computers on it, Lynch said. "It is going to grow by leaps and bounds in the next few years."

Although developing TCP/IP products for use with the Internetwork has proven attractive to vendors, many lack the technical expertise to handle the range of transmission media on the Internetwork. "Most vendors don't live in an Internetwork environment currently," Lynch noted. "They think their [TCP/IP] implementation works [everywhere] when it works on their network and talks to two or three hosts."

Although many current TCP/IP-based products work together, conference participants say they agree that differing vendor implementations of the protocols have posed problems for users. Thus, the question of whether TCP/IP-based products will operate together is expected to be a hot topic at the conference.

"People do not always implement the full TCP/IP," said Avnish Aggarwal, a member of the scientific staff at Excelan, Inc. in San Jose, Calif. "Vendors take liberties sometimes about what parts of the standard they'll implement."

Lack of a standard implementation of Netbios, which is currently emerging as a session-layer networking standard, is also causing problems, according to Aggarwal, who is chairing the committee concerned with Netbios implementation on TCP/IP.

With a standard Netbios interface, users could buy network boards from several vendors and install them on the same network without worrying that applications wouldn't run.

Excelan and Mitre Corp. are two of several vendor and user-oriented organizations that have been working to develop an interface between Netbios and TCP/IP running on Ethernet. This core group is expected to present a draft of its recommendations for comment to the group that will meet Aug. 28 here in Monterey.

During the TCP/IP conference, implementors of the protocols will get a chance to talk to the designers about future extensions to the current protocols. Gateway issues and a migration path to emerging International Standards Organization (ISO) standards will also be discussed.

"The [issue] isn't so much a particular single protocol, but the use of the conglomerated family of [TCP/IP] protocols in different ways over different networks," Holmgren said. "That's where there are no standards."

The Defense Department has committed to migrating to ISO standards, but it will be some time before ISO products are generally available. "TCP/IP right now has a lot of steam," Aggarwal said. "The [department] has given its blessing to ISO in the long term, [but] I don't expect TCP/IP to disappear for 10 years. It's a mature protocol. You'll see TCP/IP and ISO co-exist."

Although Excelan and other vendors are now preoccupied with developing a standard interface for Netbios on TCP/IP running on Ethernet, Aggarwal said it won't be long before the networking community begins considering how to implement Netbios on ISO.

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▸ EMERGENCY APPLICATIONS

Satellite transmission aids forest-fire fighters

Mobile dishes deal news to remote crews.

BY MARGIE SEMILOF
Senior Writer

BOISE, Idaho — A rapidly implemented satellite communications system is helping some 18,000 firefighters battle forest fires currently raging across 700,000 acres of wilderness in Idaho and Oregon.

Officials say L-band and Ku-band earth stations are being used to transmit information to dispatch stations and crews working in remote locations that might otherwise be incommunicado.

Firefighters in Oregon base camps communicate using two Communications Satellite Corp. (Comsat) dishes. Each is a Telesystems TCS-9000, single-channel, L-band, earth station. These are used to transmit requests for remote site supplies and to exchange information about shift-changes. Instructions are issued via voice or data transmission, although not simultaneously, through the International Maritime Satellite Organization's Inmarsat satellite.

When fires in the remote Idaho locations flared up last week, Peterson's organization tried to obtain portable L-band dishes like the ones used in Oregon. Additional earth stations were unavailable, so officials at the Boise center leased two Ku-band systems from Skyswitch Satellite Communications Co., a Golden, Colo.-based vendor.

The Ku-band's multiple-channel capacity allows firefighters and site operators to run voice and 4.8K bit/sec data simultaneously. After the dishes are transported to remote fires, they are used to transmit information to the Skyswitch hub site in Golden. Fire information and orders for supplies are transmitted from the hub site to base camps.

Firefighters in the Oregon fire sites and in the district offices use Grid Systems Corp.'s Compass laptop computers to transmit information through the L-band setup.

In Idaho, Data General Corp. terminals are linked via available phone lines to the Ku-band satellite dish. These terminals transmit data to a DG MV-8000 superminicomputer in the Boise headquarters.

"When the demand for communications equipment in Idaho arose, we had to make a decision," Peterson said, "We had the satellite network and terminals on-line in about 32 hours."

In the past, Peterson said fire crews relied solely on telephone service and hand-held radios to communicate equipment needs and fire information to central dispatch locations. Several of the fires being battled last week were located in areas without phone service, and many were at least 20 miles from a power source.

Officials at the Boise center tested a military-owned L-band satellite system last year, but were unable to buy an adequate product that would suit their needs.

Peterson said the Boise agency preferred the smaller, more portable L-band dishes and laptop computers. This year, he said, the center is evaluating several other dishes that could aid firefighters. However, the Boise center is currently unable to fund such a system — which costs about $40,000 for each L-band dish and $60,000 for each Ku-band dish, in addition to transponder costs.

"If we found an appropriate system," he said, "we would find some way to buy it."

Although the Ku-band dishes and DG terminals have proven to be effective communications tools, they are cumbersome. The terminals require a telephone hookup to the satellite dish, which is difficult to obtain in remote regions.

The center has a full-time staff ready to ship supplies at a moment's notice, Peterson said. "The satellite network speeds up this process. There is no waiting," he said. "After all, site commanders won't put a crew into the field without communications."

Louisiana from **page 2**

wanted a usage-sensitive billing arrangement.

Louisiana received three replies to its request for proposal (RFP). "AT&T essentially bid its tariff rate," Walker said, adding that AT&T did not meet all of the requirements outlined in the RFP.

ITT USTS submitted a proposal, but since it was filed after deadline, it could not be considered, according to state law, Walker said. The winning bid by LDX Net specified a monthly voice and data communications bill that Walker said will amount to $152,000 less than AT&T service.

"Because the prices bid by LDX Net were the same for the end-to-end and backbone arrangement, we said, 'fine, if it's going to cost us the same, you go right ahead and manage it all.'

"That means we write one check to LDX Net," Walker said."We don't pay anthing to South Central Bell. And LDX Net is also our centralized point of contact for all voice and data trouble reporting."

The provisions for end-to-end management mean LDX Net is responsible for all circuits on the network, including those provided by South Central Bell and independent telephone companies. The contract requires LDX Net to provide four-hour response time for repairs at a fixed five-year cost.

"We wanted to make sure that we could take advantage of any other attractive service rates," Walker said. "Since we signed the contract, for example, U.S. Sprint and MCI have lowered their rates."

The contract also requires LDX Net to pay a $200 penalty for every hour or portion of an hour that the network is down, Walker said.

In June, LDX Net began cutting over its fiber-optic voice service in place of the existing AT&T service. Cutover was completed at the end of July, Walker said. "We completed the installation without a single user complaint," he said.

The data portion of the Louisiana network is currently being installed. "Data, I believe, is trickier because it is not point-to-point," he said. "I know at least one circuit that has 20 drops, not terminals, drops. You are also talking about more sites that are out in rural areas and those involve little independent telephone companies."

Satellite from **page 5**

1989, when demand is expected to be at its highest.

Despite Secretary Dole's good news, however, commercial launches are expected to be more expensive than the shuttle option because shuttle launches were subsidized by as much as 40% by the government.

Nasa isn't done with commercial launches yet, despite Reagan's directive.

The agency will honor some of the 44 payload contracts it has with satellite builders, although the exact number remains in question. Nasa Administrator James C. Fletcher, who favored the continuation of Nasa's commercial launches, said he would like to honor as many as the outstanding contracts as possible.

The Reagan admistration is expected to develop a priority list that will give foreign governments and commercial satellites first consideration.

Letters:

Equal T-1 time

I read with interest the feature focus "Big bucks in T-1 mux" (*Network World*, July 21) and was disappointed that Tellabs was not included.

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A better net tester

I was pleased to see that *Network World* finds our Model 9980 Maintenance Isolator noteworthy ("Net tester tool out," July 21). However, there were some important features of the instrument that were incorrectly described; so I clarify them here.

The unit was said to test only end-to-end copper circuits. The instrument is actually much more versatile than this.

While it does need a metallic access point, it can easily test voice circuits that pass over digital facilities. In today's hybrid analog/digital networks, this sort of capability is quite practical.

An end user can put a Maintenance Isolator at each end of his network to test the T-1 facilities in between.

The fact that the unit is not computer controlled was claimed to be a deficiency. Wiltron Co. manufacturers a computer controlled remote testing system called CMTS. The advantage of the Maintenance Isolator 9980 in relation to CMTS is that it is much less expensive, less than $3,000 compared with more than $12,000, and is much simpler to install and administer.

Finally, it is inaccurate to say the instrument cannot detect a busy signal.

If a call is in progress and there is a busy signal on the line, the test operator will be able to hear the busy signal by using the circuit monitor function. The operator always uses the monitor before proceeding with testing.

The people using the circuit do not notice the monitor because of its characteristic high impedance. The monitor automatically is removed after the few seconds so that privacy is disturbed as little as possible.

Paul A. Marshall
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Letters may be edited for space and clarity.

▶ COMPARATIVE REVIEW

Ace fax machines rush delivery

Of these three high-performance transceivers, the NEC is the one to beat.

BY JOHN J. HUNTER
Contributing Writer

In less than five years, facsimile transceivers have changed radically. Once considered slow white elephants that required six minutes or more to transmit an average business letter, today's facsimile machines do the job in 30 seconds or less.

Facsimile transceivers go a long way toward improving human productivity. Facsimile machine operators once stood for hours dialing remote locations and hand-feeding each document without ever leaving the machine site. Now a number of machines can store pages internally and automatically dial the drop sites. In short, facsimile has moved from the realm of a solution looking for a problem to a first-rate productivity tool.

Reasonable facsimilies

Three of the best examples of this new breed of facsimile transceivers are the NEC America, Inc. BIT IV, the Pitney Bowes, Inc. Model 8900 and the Ricoh Corp. R-610. The R-610, to be announced at the September Telecommunications Association (TCA) show, replaces the Ricoh R-5000.

The R-610 and the Model 8900 are compatible with the scan rates, transmission speeds and protocols established by the Consultative Committee on International Telephony and Telegraphy Groups 1, 2 and 3 standards for open facsimile communications.

The BIT IV supports G2 and G3 as well as Group 4 standards. The latter is a proposed specification that has yet to be officially adopted by the CCITT. Group 1 is for FM transmission and requires transmission times of four or six minutes to send a typical 8.5- by 11-inch page. Group 2 employs AM transmission and needs three minutes to transmit the same size page.

Group 3 produces a digital output from the transceiver and requires less than a minute for transmission. The three products reviewed here transmit a page in 13 to 20 seconds. The exceptions to this rule are discussed later.

These three transceivers scan an input document at a ratio of 200 by 100 lines per inch for standard print quality, and 200 by 200 lines per inch for fine print.

All three units also have a gray-scale facility, which permits them to transmit and receive photographs. While no longer a unique feature, photo handling is still not widely available on commercial facsimile units.

NEC's BIT IV provides an optional scan rate of 400 by 400 lines per inch. Pitney Bowes will offer 300 by 400 lines per inch with its Model 8200, which will also be introduced at TCA next month. These scan rates allow both units to handle superfine inputs, but limits the transmit and receive operation to other BIT IV and Model 8200 units.

Of the three units reviewed, only NEC's BIT IV has an autoscan resolution facility. Incidentally, the Fujitsu America, Inc. Model 6300 and the Telautograph Corp. Omnifax 99 are the only other units that currently have this capability. With autoscan resolution, the scanner automatically switches from standard to fine scanning to compensate for uneven print quality.

With systems not offering this facility, the operator must set the scanner rate at fine to compensate for inconsistent print quality. Fine scanning, however, uses a slower scan rate that increases transmission time. All three products will probably transmit a page in 30 seconds for standard settings and in about 55 seconds for fine. While the vendors' literature lists much shorter times, for example, 24 seconds for fine, the forementioned numbers are more realistic.

All three facsimile units employ Group 3 standard data compression schemes to eliminate redundant characters and white space from the transmitted data.

Each unit also employs its own proprietary compression scheme to improve transmission speeds and efficiency further. When operating with proprietary protocols, these units will be compatible only with facsimile transceivers that recognize the protocol.

By using these proprietary schemes, the BIT IV and R-610 are able to transmit a page in about 12 seconds to similar units; the Model 8900 requires 14 seconds. The BIT IV, using the superfine 400 by 400 setting, takes 20 seconds to transmit a page. No transmission speed for the 8200 was available at press time.

The Ricoh and Pitney Bowes machines employ thermal printing, which requires special thermal paper. The NEC unit uses laser printing and can use plain paper for reproductions.

While the capabilities discussed so far are impressive, what sets these facsimile units apart are their page-storage functions. All have some form of internal or attached memory devices that permit users to enter multiple pages and sequentially broadcast them to other units. All can also act as a hub unit, where one facsimile unit accepts pages from other units, stores them and then routes them to their final destinations.

The BIT IV and Model 8900 employ a 20M byte Winchester-like disk unit as the storage medium, while the R-610 uses random-access memory (RAM). Ricoh's RAM-based facility is a carryover from its SAF-PAK option, first introduced for the R-5000 a few years ago. Unlike the original SAF-PAK, the RAM employed by the R-610 is internal and can accommodate up to 60 pages, or double the amount available with standard SAF-PAK.

The BIT IV and Model 8900, in contrast, have a maximum capacity of 500 and 600 pages, respectively. The new Pitney Bowes Model 8200 will allegedly have a 1200-page capacity. The distribution of stored pages can be done individually or on a broadcast basis. For individual transmissions, the user can dial a location's telephone number, or numbers can be preestablished in an autodial directory.

Facsimile transceiver characteristics

Vendor/ Product			
NEC America, Inc. Bit IV	Pitney-Bowes, Inc. Model 8900	Ricoh Corp. R-610	
	✓	✓	CCITT group 1, 2, and 3 compatibility
✓	✓	✓	Page storage
✓	✓	✓	Hub facility
✓			Autoscan resolution
✓			Simultaneous send/receive
✓	✓	✓	Mailbox
laser	thermal	thermal	Printer technology
500	600	60	Storage/ capacity (in pages)

SOURCE: TMS CORP., DEVON, PA.

All three facsimile units have single-button autodialing, and all permit multiple telephone numbers to be associated with a single button. With broadcast transmission, all terminals on a general distribution list will receive all pages unless receiver groups are established.

This procedure allows users to assign certain pages to be broadcast to specific groups, thereby reducing the transmission of unwanted pages. NEC allows as many as 20 groups to be formed, while the Ricoh and Pitney Bowes units support 16 and 10 groups, respectively. Each group has a telephone number appended, which allows the system to call the receiving site.

Turnaround polling

The BIT IV, R-610 and Model 8900 support turnaround polling to determine if terminals receiving pages also have pages to send to the polling unit. This obviates the need to establish two different telephone connections.

While NEC, Pitney Bowes and Ricoh claim that terminal polling and turnaround polling will work with any CCITT-compatible Group 1, 2 and 3 terminal, users should ask for a test. Differences in the way vendors implement protocols may prohibit this type of application.

The BIT IV comes with two CCITT G3 ports, which permit it to operate in full-duplex mode and send documents to two different locations. This dual-port function also permits the BIT IV to receive documents while it is sending. Neither Ricoh nor Pitney Bowes units have this capability.

Ricoh's R-610 can enter a page into memory while the unit is receiving, but sending is deferred until receiving is finished. Pitney Bowes claims in the future, it will offer a capability like Ricoh's in its Model 8200.

All three products have a mailbox facility where private messages can be sent to individual users. With the Ricoh unit, the user receives no direct message. The sending party must phone the receiving party and provide the password under which the message is stored. The logic behind this procedure is faulty. Why bother with the facsimile at all?

Pitney Bowes and NEC inform the user by displaying a message on the facsimile control console. They also print the name of the recipient on the facsimile built-in supervisory printer.

The bottom line

For pure capability, the NEC BIT IV is clearly the product to beat. With its disk-storage capability, simultaneous send/receive transmission capability, autoscan resolution, laser printing and an optional 400 by 400 line-per-inch scan rate, it blows the competition's doors wide open. But just as with cars, such performance comes at a premium — $12,000 is the BIT IV's window price.

For those who can get by with a little less muscle, the Pitney Bowes 8900 is a good machine. However, 8900 users must settle for standard G1, G2 and G3 scan and transmit facilities. When the Model 8200 with its 300 by 400 line-per-inch scan rate becomes available, Pitney Bowes will move the 8900 a notch closer to the BIT IV, but this new product will still be far behind NEC. On the other hand, at about $5,000, the 8900 carries a less lofty price.

The Ricoh R-610 is basically a good machine, but is hampered by its limited storage capacity. While a 60-page capacity is not bad for normal transmissions, it limits the number of pages or groups that can be assigned. Other than that, it's comparable to the Model 8900 and carries the same price tag. ◻

Hunter is president of TMS Corp. in Devon, Pa.

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